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The Effects of Entry Timing and Entry Mode Decisions on Firm Performance: the Role of Competitive Strategy and Environmental Factors
Autor/es
Beatriz Pérez-Aradros Muro
Director/es
Jaime Gomez Villascuerna y Idana Salazar Terreros
Facultad
Facultad de Ciencias Empresariales
Titulación
Departamento
Economía y Empresa
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**UNIVERSIDAD
DE LA RIOJA**

DOCTORAL THESIS

**THE EFFECTS OF ENTRY TIMING AND ENTRY
MODE DECISIONS ON FIRM PERFORMANCE:
THE ROLE OF COMPETITIVE STRATEGY AND
ENVIRONMENTAL FACTORS**

PhD. Candidate:

BEATRIZ PÉREZ-ARADROS MURO

Supervised by:

Dr. JAIME GÓMEZ VILLASCUERNA

Dra. IDANA SALAZAR TERREROS

Cuestiones preliminares

El artículo 3 de la Normativa para la defensa de tesis doctorales en la Universidad de La Rioja recoge la posibilidad de que la tesis sea desarrollada y defendida en castellano o en otro de los idiomas habituales para la comunicación científica en su campo de conocimiento, distinta a cualquiera de las lenguas oficiales en España. En este último caso, se precisa que, al menos, el resumen y las conclusiones sean redactados y presentados en castellano. Se aplicará, no obstante, lo dispuesto en el artículo 16 en el caso de las tesis que opten a la Mención Internacional.

El artículo 16 de dicha normativa exige que, para obtener la “Mención Internacional”, parte de la tesis doctoral, al menos el resumen y las conclusiones, se hayan redactado y sean presentadas en una lengua distinta a cualquiera de las oficiales en España. Con el fin de cumplir con los requisitos anteriores, la totalidad de la presente tesis doctoral ha sido elaborada y será defendida en inglés.

Esta tesis doctoral ha sido financiada con una ayuda obtenida en la convocatoria de 2014 de contratos predoctorales destinados a la formación de personal investigador financiados por la Comunidad Autónoma de La Rioja.

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Chapter 1.

INTRODUCTION

1.1. INTRODUCTION

Strategic management has traditionally focused on explaining the reasons underlying firm success (Guerras-Martín, Madhok and Montoro-Sánchez, 2014) and, particularly, the strategic choices that allow firms to achieve competitive advantages over their rivals. Entering into a new market is one of the ways in which firms grow and create economic value. This is one of the reasons why the analysis of market entry decisions, as a key determinant of firm competitive advantages, has received considerable attention during the last decades (Beugelsdijk, Kostova, Kunst, Spadafora and Essen, 2018; Brouthers, 2002; Lieberman and Montgomery, 1988; 2013; Zachary, Gianiodis, Payne, Markman, 2015). Moreover, although the relevance of research carried out in the academic sphere is not always obvious for the interest of managers, entry decisions has emerged as an area that seems to align the interest of both scholars and practitioners (Fosfuri, Lanzolla and Suarez, 2013). There are many examples in the business world that make clear the importance of entry decisions in firms' competitiveness and success.

In this sense, pioneering a market has been confirmed to be a source of sustainable advantage in a large number of industries. By launching a new product that creates a whole industry, organizations such as Xerox, Freddie Laker or McCaw Cellular Communications enjoyed competitive advantages over rivals in the plain-paper copier industry, the airlines or the mass market for wireless telephony, respectively. Likewise, entering foreign markets is also seen as a potential source of firms' competitiveness. In an increasingly globalized world, organizations are meant to think of competition from a broad perspective and consider the potential for growth offered by markets worldwide. A considerable proportion of firms get involved in international markets, seeking for new business opportunities. In that regard, the World Bank data

shows a significant increase in foreign direct investments during the last decades worldwide. In particular, the net outflows of investment rose from \$ 1.404 billion in 2000 to \$ 1.915 billion in 2017, achieving the highest peak in 2007, with a global amount of \$ 3.195 billion (World Bank, 2018).

From an academic perspective, the decisions of *when* and *how* to enter new markets have drawn scholars' attention in both the strategic management and international business fields. Regarding the entry timing literature, scholars have been broadly interested in understanding the performance implications of order of entry decisions. Studies focused on this line of research generally draw on the first-mover advantages (FMAs) perspective (Lieberman and Montgomery, 1988) by arguing that pioneering firms will enjoy greater competitive advantages than those later entrants. Despite the idea that entry timing matters is widely acknowledged (VanderWelf and Mahon, 1997), the empirical evidence has been unable to provide conclusive evidence on this issue (Suarez and Lanzolla, 2007). To clarify conflicting findings, scholars have recently claimed more attention on other contingency factors that may affect the order of entry-performance relationship (Zachary et al., 2015). In that regard, firm-level conditions (Coeurderoy and Durand, 2004; Markides and Sosa, 2013) or environmental factors (Gómez, Lanzolla and Maicas, 2016; Suárez and Lanzolla, 2007) are highlighted as possible moderators in this relationship. Surprisingly, the literature seems to have overlooked its influence on the achievement and sustainability of first-mover and followers advantages.

According to the international business perspective, scholars have focused their interest on understanding multinationals enterprises (MNEs) decisions when expanding abroad. Given its relevance for cross-border business transactions, the study of MNEs entry mode choice when expanding abroad has proliferated in the last decades (see

Brouthers and Hennart, 2007, for a review). Studies on this line of research examine factors that impact on MNEs entry decisions such as whether they decide to set up their foreign affiliates by establishing a fully owned firm or whether they will share their ownership with other firms. In particular, the distance between the home and the host market is found to significantly affect MNEs entry mode choices when going international, particularly the cultural distance between countries (Beugelsdijk et al., 2018). Most studies state that MNEs will be more likely to choose lower-commitment entry modes in greater culturally distant market as a way to share risks and reduce potential cost of competing in unknown countries. Nevertheless, empirical evidence remains mixed on this issue and further analysis is therefore required (Tihanyi, Griffith and Russell, 2005). Similarly, future research efforts are need “on the other side of the equation, that is, what happens once entry mode choice has been made” (Canabal and White, 2008: 267). As several scholars claim, this seems to be a promising ground to expand current knowledge on entry mode research.

Overall, this dissertation tries to shed light on these issues by providing new insights aimed to disentangle existing contradictions, while advancing the current state of these literatures.

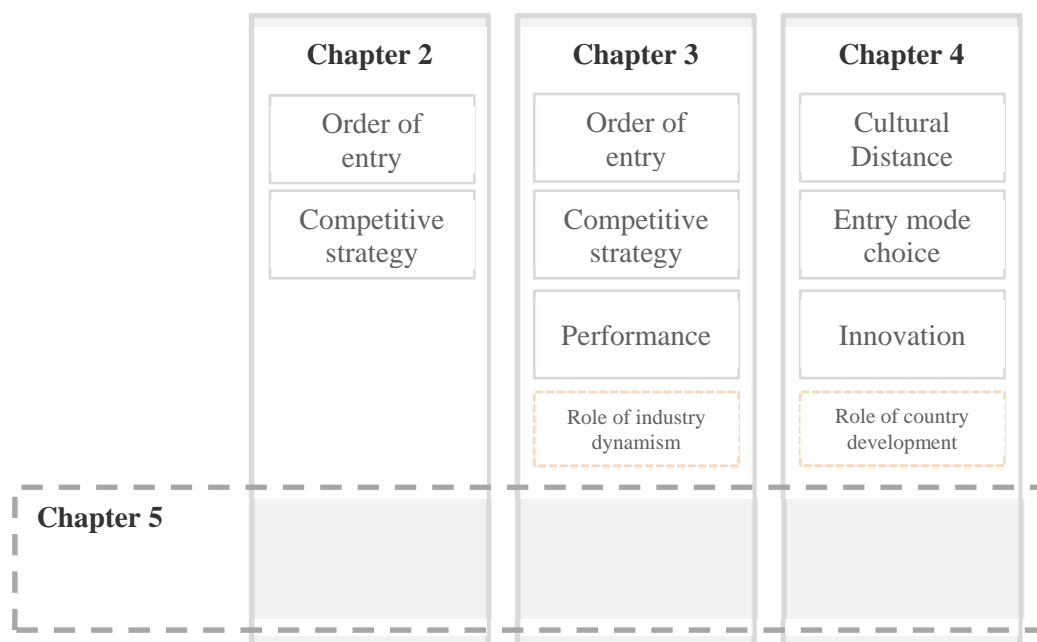
1.2. STRUCTURE OF THE THESIS

This dissertation aims to analyze how market entry decisions affect firms' subsequent competitive behavior and the achievement of competitive advantages. To this end, several issues related to entry decisions, including timing and mode, are addressed in the following chapters. In particular, Chapters 2 and 3 focus on the analysis of the order of entry in a market and its effect on firms' competitive behavior and performance. In the case of Chapter 4, the focus is on the antecedents and consequences

of firms' entry mode decisions when going abroad. Specifically, this chapter first examines the effect of cultural distance and MNEs country of origin on entry mode. Then, we analyze the impact of the entry mode choice on subsidiaries' innovation. Finally, Chapter 5 summarizes the main conclusions drawn from the three studies.

Figure 1.1 offers an overview of the structure of this dissertation, which is explained in more detail below.

Figure 1.1. Dissertation structure



Chapter 2, titled “*Does order of entry determine competitive strategies? An analysis of European mobile operators*”, aims to disentangle mixed evidence on the first-mover advantages literature by emphasizing the importance of considering the competitive strategies followed by firms. In that regard, this chapter proposes that firms will choose the most adequate strategy depending on the type of demand they face at entry, and taking into account the opportunities they have to take advantages of the isolating mechanisms. In particular, the differentiation strategy is suggested to be the one that offers an optimal fit for pioneers in their initial stages in the market. Despite the

performance consequences of entry timing are not addressed in this Chapter, the discovery of a pattern in the “order of entry-competitive strategy” relationship would suggest that first mover advantages could be explained, at least partially, by the competitive strategy chosen. This would advance in the explanation of the divergent results in the literature regarding the effect of entering first. Furthermore, Chapter 2 considers the evolution of markets, as it could affect the way in which first movers preserve their advantage over time, and condition their business strategy. In that regard, it is suggested that pioneers might need to modify their business strategies to cope with more competitive environments and changing consumers’ needs as the market matures. Particularly, we propose that pioneers are more likely to change from an initial differentiation orientation towards a hybrid position.

The main contributions of Chapter 2 are the following. First, from a theoretical point of view, Chapter 2 includes a valuable integration between the order of entry and the competitive strategy literatures aimed at improving current knowledge on first-mover advantages. Second, the empirical evidence suggests a key role for competitive strategies in explaining the relationship between order of entry and performance. Our results confirm significant differences in the strategies chosen by each cohort of entrants. Moreover, the longitudinal nature of the research presented in Chapter 2 contributes to improve the comprehension of how pioneers obtain and sustain their competitive advantages as the market matures. In particular, the evidence suggests that the value created is reduced over time. In the long run, the gap between pioneers’ and followers’ competitive positions (in terms of relative quality, relative prices and relative operating efficiency positions) seems to be eroded. These results address current scholars’ demands on post-entry strategies research in entry timing studies.

Chapter 3, *“How to defeat early entrants: The role of competitive strategy and industry dynamism on early mover advantages in the telecommunications industry”*, expands research from Chapter 2 by taking into account the effect of the “order of entry-competitive strategy” relationship on firm profitability. Following a configural approach, Chapter 3 proposes a theoretical model in which certain competitive strategies, those that are presumed to offer an optimal fit with each cohort of entrants, would offer greater performance levels than the rest. The differentiation strategy is suggested for early entrants, whereas cost leadership is the best option for followers. Moreover, Chapter 3 incorporates the effect of industry dynamism, as it has been recently suggested to play a key role in explaining the sustainability of first-mover advantages. In particular, factors such as the pace of market growth or the pace of technology evolution have been shown to have a detrimental effect on pioneers’ advantages. To advance knowledge on this line of research, Chapter 3 emphasizes the need to consider how industry dynamism could affect the effectiveness of the strategies implemented by followers to erode early-mover advantages.

The main contributions of Chapter 3 are the following. First, to improve current understanding of how each cohort of entrants create and sustain their performance advantages, Chapter 3 proposes a theoretical model in which the joint effect of micro (i.e. competitive strategies) and macro (i.e. industry dynamics) aspects is considered. Second, the empirical evidence presented in Chapter 3 provides a nuanced picture of the importance of considering competitive strategies to explain performance differences associated to the order of entry. It is shown to be particularly relevant when assessing followers’ success since they are better off when competing with a cost strategy, which is presumed to offer an optimal fit with follower firms. Finally, the role of environmental conditions is underlined. Industry dynamism is shown to significantly

influence the effectiveness of followers' strategies in reducing the performance advantages of entering first.

Chapter 4, "*Entry mode and innovation adoption of multinational firms: The effect of cultural distance and home/host country development*", aims to delve into the understanding of the factors that influence multinational enterprises (MNEs) strategic decisions when expanding abroad. Two main decisions are considered in this study. Firstly, Chapter 4 examines the factors affecting the choice of entry mode in foreign markets. In that regard, this chapter extends previous literature by analyzing the role that the development of the country of origin of MNEs plays in explaining differences in their internationalization behavior in culturally distant markets. Secondly, Chapter 4 expands current knowledge MNE-subsidary relationship by analyzing how subsidiaries create value in foreign markets after their entry. The focus of this second part is on the influence exerted by the entry mode chosen on the subsidiary decision to innovate. In particular, it is proposed that shared-owned subsidiaries will show lower adoption speed of innovations than fully owned subsidiaries. The moderating role of the host market development is suggested because of its potential in reducing the risks and the costs associated to innovation.

The main contributions of Chapter 4 are the following. From a theoretical point of view, Chapter 4 aims to shed light on the lack of consensus regarding the effect of cultural distance on entry mode choice. To this end, Chapter 4 refines prior theoretical arguments by emphasizing the need to consider the influence exerted by additional factors, such as the country of origin of MNEs, commonly overlooked in prior analyses. Moreover, this chapter expands current knowledge on MNEs' after-entry decisions by reflecting on the impact of the entry mode on the risks and costs assumed by firms when carrying out innovation. Empirically, Chapter 4 contributes to the international business

literature in three main ways. First, the role of the country of origin is underlined as a key moderating factor of multinationals' internationalization behavior. Second, this chapter provides new insights on MNEs subsidiaries' behavior, as differences in innovation are shown to be conditioned by entry mode choices. Finally, Chapter 4 addresses current scholars' demands by taking into account the endogeneity associated to entry mode decisions when analyzing MNEs post-entry strategic behavior.

Finally, the last chapter, "Summary and Conclusions", presents a summary of the main findings and contributions of this doctoral thesis.

1.3. THEORETICAL FRAMEWORK

The theories used to explain firms strategic entry decisions and their consequences are described in more detail below. As indicated in prior sections, this dissertation comprises two main dimensions of market entry: entry timing decision and entry mode choice. Accordingly, the theoretical framework section has been divided into two main parts. The first part provides a literature review regarding firms' entry-timing decisions. The theoretical perspective referred to MNEs decisions when going abroad is presented in the second part.

1.3.1. Entry timing advantages and its evolution over time

The study of entry-timing strategies constitutes an established body of the literature in the strategic management research. There has been a large volume of work published on this issue during the last decades (see Fosfuri et al., 2013; Zachary et al., 2015) and, particularly, on the idea that entering first a market matters (Kerin, Varadarajan and Peterson, 1992; Lieberman and Montgomery, 1988). Based on the seminal work of Lieberman and Montgomery, the theory of first-mover advantages (FMAs) suggests the order of entry (i.e., being first) as a core predictor of firm

performance. Empirically, the hypothesis that firms that enter a market early obtain higher performance advantages than followers is generally supported, though the evidence is largely dependent on the characteristics of the study developed (VanderWelf and Mahon, 1997).

Research on the FMAs theory has been developed around three main areas of investigation. First, scholars have examined the “isolating mechanisms” that allow first-movers to achieve advantages and protect their rents from future erosion (Lieberman and Montgomery, 1988; Rumelt, 1987). Second, the resource-based view perspective has been employed to explain the existence of FMAs in terms of the set of resources and capabilities that allow firms to exploit advantages of entering first (Robinson, Fornell and Sullivan, 1992). Finally, and less studied, the environmental-level conditions that influence the achievement of FMAs by acting as enablers or disablers (see Suárez and Lanzolla, 2007).

Despite the considerable body of research focused on this issue, “the academic literature has been unable to provide conclusive empirical evidence to support or refute the existence of FMA” (Suarez and Lanzolla, 2007: 377). Consequently, scholars have recently emphasized the need to consider new perspectives that expand current knowledge on the traditional “order of entry-performance” relationship (Fosfuri et al., 2013). Particularly, it seems obvious the need to develop an more integrated theoretical framework that allows researchers to improve current understanding on the mechanisms and other contingency factors that affect the achievement of entry-timing advantages (Zachary et al, 2015).

Chapters 2 and 3 aim to address scholars demands by incorporating the examination of different elements that could affect the relationship between firms’ order of entry and performance. The analysis of factors such as the competitive strategy used

by each cohort of entrants to create value and achieve competitive advantages (Markides and Sosa, 2013), as well as the effect of market evolution on the sustainability of first mover advantages (Suarez and Lanzolla, 2007) is considered.

To develop a more comprehensive and integrated conceptual framework, Chapters 2 and 3 make use of two main theories related to the evolution of markets: the product life cycle (Vernon, 1979) and the diffusion of innovations among consumers (Rogers, 1995). Regarding the former, the product life cycle theory explains the evolution of most products as a history of their passing through certain recognizable stages: from introduction to decline. Each of them is characterized by presenting a few peculiarities, in terms of demand levels or cost structures, which condition market evolution. In the case of the theory of diffusion of innovations (Rogers, 1995), the focus is on the features of the different categories of potential adopters existing in a market, as the innovation is diffused over time among the social system.

Overall, the integration of the FMAs with these literatures serves as a basis for the refinement of our understanding of the entry-timing literature. Likewise, it contributes to advance research on the business strategy field and, more generally, on the strategic management literature.

1.3.2. Entry mode decisions when expanding abroad: a transaction cost perspective

As one of the most critical decisions for multinational enterprises (MNEs) international expansion, the entry mode choice has attracted scholars' attention during the last decades. In particular, a large body of research has focused on examining potential factors that may impact on the probability to choose higher or lower control levels over the foreign subsidiary (see, Brouthers and Hennart, 2007, for a review).

Given its importance in the management and international business fields, the study of MNEs entry mode has been approached from a wide variety of theoretical perspectives: transaction cost theory, the resource-based view, the institutional theory or Dunning's eclectic framework, among others. Nevertheless, as Brouthers and Hennart (2007:400) point out in their meta-analysis, the transaction cost theory (TCT) stands out for being "the most widely used theoretical perspective in international entry mode research".

TCT identifies two main characteristics of human nature: bounded rationality and opportunistic behavior (Williamson, 1985). Regarding the former, Simon (1982) states that the rationality of individuals is limited by their cognitive limitations, as well as by the information available to take the decision. In the case of the latter, opportunism has been related to an individuals' behavior seeking for "self-interest with guile" (Williamson, 1985:47). According to TCT, there are three main factors that may influence individuals' decisions: assets specificity, uncertainty and frequency. Specificity of assets arises when investments made for a given transaction have a very low value in alternative uses. Uncertainty refers to the lack of information about the conditions surrounding the transaction or about the behavior of individuals. According to the frequency with which transactions recur these can be classified into occasional or recurrent (Williamson, 1985). On this basis, studies rooted in the transaction cost perspective consider the entry mode choice (shared vs. full ownership) as a critical decision of governance, in which managers seek for cost minimization. For instance, firms may be more likely to choose a shared ownership entry mode in more culturally distant countries in order to reduce the uncertainty involved in unknown markets by sharing risks and costs with other partners (Gatignon and Anderson, 1988).

In spite of the large body of research on the transaction cost determinants that drive MNEs entry mode choice, the theoretical arguments and the empirical findings are

mixed and further research on this issue is required (Brouthers and Hennart 2007; Zhao, Luo and Suh, 2004). Among others, the country of origin of MNEs has been recently suggested as a potential factor that may impact their internationalization behavior, particularly when comparing firms from developed versus developing economies (see, for instance, Cuervo-Cazurra, 2012). The rationale behind considering the influence of the country of origin roots on the potential impact that the particular conditions of developing and emerging economies (such as social, normative or economic voids) may exert on their foreign expansion. Chapter 4 focuses on this emerging body of research and examines the extent to which the development of the country of origin of MNEs moderates the relationship between the cultural distance between home and host markets and the entry mode.

TCT has also been broadly applied to studies examining firms' decisions that involve high levels of uncertainty and intangible assets, such as the ones related to innovation (Gooroochurn and Hanley, 2007). In that context, firms must balance the risks and costs when pursuing innovation in a shared or fully owned firm. On the one hand, shared ownership may confer firms cost advantages in the innovation process, while allowing partners to diminish risks and uncertainty surrounding the final output. On the other hand, firms may run the risk of increasing costs due to two main reasons. Firstly, firms incur in *ex ante* search costs of potential partners and bargaining costs to enforce the contract that protects each parties' interests when running the innovation project. Secondly, firms may experience *ex post* renegotiation costs stemming from partners opportunism as the collaborative relationship goes by (Williamson, 1985). Therefore, organizations should balance the potential cost and risk incurred when pursuing an innovation project with third parties. Despite its potential implications for

MNEs when going abroad with shared-owned ventures, scarce research has been developed on this matter.

From an international business perspective, scholars have recently underlined the need to further improve the understanding of MNEs post-entry behavior (Meyer and Peng, 2016). It is important to know, not just how multinationals enter, but also how they create value and grow in the host market (Canabal and White, 2008). Surprisingly, there is a scant number of studies focused on the analysis of the internal processes of MNEs' subsidiaries such as the development, coordination, and exploitation of resources (Meyer and Peng, 2016). Similarly, more studies are needed on subsidiaries's competitive behavior abroad (Zhou and Li, 2008).

In sum, a deeper understanding on how MNEs compete abroad may offer new insights that cover the gaps identified in the international business literature. In that regard, the integration of the entry mode literature with other bodies of research explaining subsidiaries's behavior would advance the state of the art. Chapter 4 tries to shed light on this issue by addressing the relationship between MNEs entry mode and its innovation behavior.

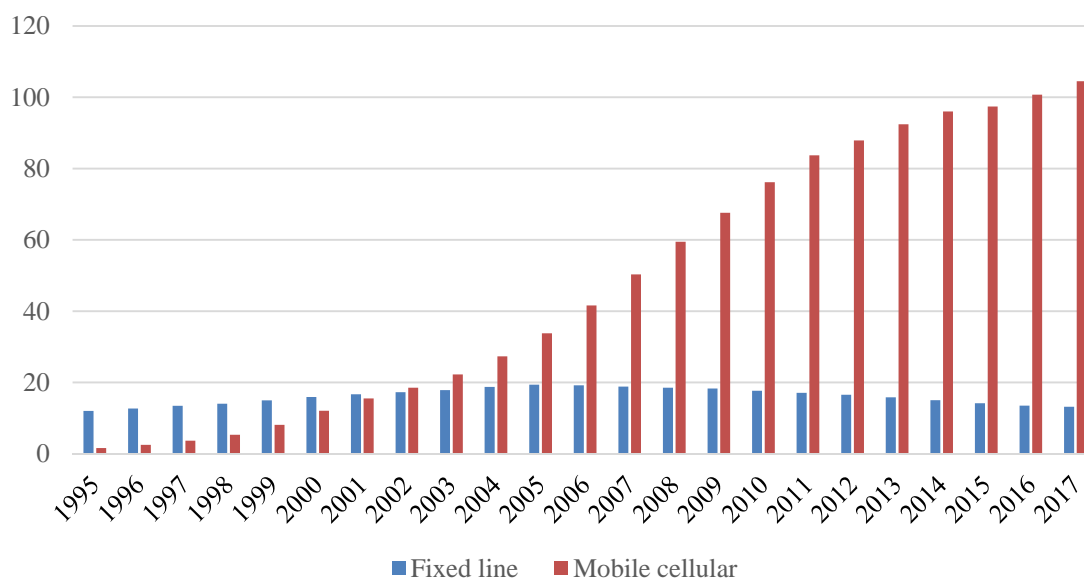
1.4. RESEARCH SETTING: THE MOBILE TELECOMMUNICATION

INDUSTRY

The mobile telecommunication industry has drawn the attention of numerous scholars during the last decades, particularly in the management field (Bijwaard, Janssen and Maasland, 2008; Fuentelsaz, Garrido and Maicas, 2015; Gómez and Maicas, 2011; Japokin and Klein, 2012; Kim, Park and Jeong, 2004). This is not surprising, given the growing importance of the telecom industry in driving the digital transformation of the society as well as its impact on worldwide economic growth.

To illustrate this, Figure 1.2 shows the evolution of the telecommunication industry by presenting the penetration rate of fixed and mobile services in the world during the last decades. The information presented in Figure 1.2 shows the total number of subscriptions by technology, expressed as a percentage of the country's population. It can be observed that the mobile penetration rate has experienced a considerable increase from almost 2 percent in 1995 to 104 percent in 2017. The penetration rate achieved in 2017 confirms that the number of mobile subscriptions has exceeded the worldwide population, which is largely explained by the multiple device ownership of mobile users (e.g., corporate and personal devices). It shows the increasingly importance of the mobile technology in people lives worldwide. This accelerated diffusion of mobile technology is clearly different from that displayed by the previous technology. Figure 1.2 illustrates that the penetration rate of fixed line subscription increased by 12 percent in 1995 to 19 percent in 2005, the year in which fixed lines reached its highest peak.

Figure 1.2. Total fixed and mobile subscriptions worldwide (per 100 people)



Source: World Development Indicators (2018).

With more than 5,000 million mobile subscribers at the end of 2017 (World Development Indicators, 2018), the telecom industry stands out for being one of the

industries with greater socioeconomic impact worldwide. Regarding its economic implications, it is important to highlight that the mobile technologies and services generated 4.5% of GDP globally in 2017, as reported by the GSM Association (2018). This contribution, which amounted to \$3.6 trillion of economic value added, is expected to reach 5% of total GDP by 2022. Besides, the wider mobile network contributed to the global economy by supporting a total of 29 million jobs (directly and indirectly) in 2017. Overall, this illustrates the relevance of the telecom industry to the economic growth.

Given its social and economic importance, the appearance of a large number of competitors in the last decades is not surprising. Table 1.1 shows the number of entries in the mobile industry worldwide since 2000. The number of entries is especially important during the first ten years. The slightly decrease in the number of entries from 2010 onwards might be explained in terms of the market saturation that most developed countries experienced in the last years. Overall, the dynamism shown by the telecom sector makes it a suitable context to focus the research interest on firm's entry decisions.

Table 1.1. Number of entries in the telecommunication industry worldwide

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
48	55	31	58	53	45	38	67	48	44	23	12	24	17	28	16	21

Source: GSMA Intelligence (2018).

Finally, it should be important to mention that the three studies of this thesis, which are included in chapters 2, 3 and 4, use data from the GSMA Intelligence Database¹. The information included in this data set provides an overview of the evolution of the telecommunications industry from the beginning of the 21st century to the present. In particular, the GSMA Intelligence offers information on an extensive set

¹ Additional information to develop the empirical analyses is gathered from the indicators of the World Bank, the cultural dimensions offered by the Hofstede index and the countries classification developed by the International Monetary Fund. Complementarity information of the telecommunication industry has been collected from press releases and operators' consolidated annual reports.

of mobile operator metrics, forecasts and industry reports in every country worldwide. Among other operating and performance indicators, the database offers information about firms' dates of market entry, market share, revenues, ownership structure, price levels, type and number of technologies launched and service coverage. Such a detailed data set provides the information necessary to carry out rigorous empirical analyses. In particular, this information allows us to define the variables used in Chapters 2, 3 and 4 to assess the moment of entry of each firm worldwide, as well as the competitive position that operators adopt to enter, compete and create value in the long-run. Finally, it should be highlighted that the GSMA Intelligence encompasses information from the whole population of mobile communication operators (closed, merged and alive) over the last two decades, which provides a promising research setting to perform an exhaustive analysis.

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Chapter 2.

DOES ORDER OF ENTRY DETERMINE COMPETITIVE STRATEGIES?

An analysis of European mobile operators

2.1. INTRODUCTION

Entry-timing decisions have been one of the most relevant topics of research for decades (for a review, see Fosfuri et al., 2013; Kerin et al., 1992; Lieberman and Montgomery, 1988, 1998; Zachary et al., 2015). One reason is that order of entry has been considered one of the essential strategic decisions that determine firm survival and growth (Mascarenhas, 1992; Mitchell, 1991; Robinson and Min, 2002) and profitability (Lambkin, 1988). However, the lack of consensus on its ability to generate a sustainable competitive advantage has attracted scholars' attention. As Franco et al. (2009: 1842) maintain, "in spite of 839 publications on first-mover advantage (FMA) in peer-reviewed journals, its existence has neither been conclusively proved nor refuted".

For some authors, this can be partly explained by conceptual problems or shortcomings in the existing framework (Lieberman and Montgomery, 1998; Suarez and Lanzolla, 2007; Zachary et al., 2015). Although recent research has improved our understanding of the isolating mechanisms (Gómez and Maicas, 2011), of the role of firm capabilities (Franco et al., 2009) and of the enabling effects of macro contingencies (Gómez, Lanzolla and Maicas, 2016; Suarez and Lanzolla, 2007), there are still some gaps that need to be filled. In this context, different studies emphasize the importance of business models (Markides and Sosa, 2013) and competitive strategies (Zachary et al., 2015) in the explanation of first mover advantages. Furthermore, they stress that there is "insufficient research on postentry strategies" (Zachary et al., 2015: 1408). Despite the relevance of these topics for the conceptual underpinnings of the theory of first mover advantages and for our understanding of the empirical evidence, research on these two areas is scarce.

In this paper, we change the focus of research on first mover advantages from the analysis of the entry timing strategy to the study of the strategy of entry. Our first objective in this paper is to study whether the order of entry is associated with differences in the

competitive strategy followed by firms. Therefore, we do not focus on explaining the performance effects of the order of entry, but on the choice of competitive strategy by the different cohorts of entrant. We argue that pioneers are more likely to choose a differentiation strategy at entry, the reason being that innovators and early adopter consumers, who are more likely to be less concerned with uncertainty, are also likely to have a higher willingness to pay (Rogers, 1995). In this context, a differentiation strategy offers the best fit with the type of consumer found in the early stages of development of a market. At the same time, this strategy also offers a way to take advantage of the isolating mechanisms proposed by Lieberman and Montgomery (1988)—namely, switching costs, technological leadership and pre-emption of scarce assets.

Our second objective is to study how the strategies of the pioneers evolve over time. Conceptually, this implies an understanding of entry as a process and not as an isolated event (Zachary et al., 2015). This is critical if we want to comprehend the way in which first movers preserve their advantage over time through the competitive strategy chosen, or how these advantages disappear, as the literature suggests (Lieberman and Montgomery, 1998, 2013). It also implies that we explicitly incorporate time in our theoretical framework and in our analyses (Zachary et al., 2015).

After developing our conceptual model along those lines, we test our hypotheses on data from the European mobile telecommunications industry for the period 2000–2016. This industry generated three per cent of the European GDP in 2014 (GSMA, 2015) and has experienced significant growth in the last two decades. For example, during the period 1998–2017, the average mobile penetration rate increased from 20% to almost 135% in Europe, according to the information provided by the GSM Association. Significant market growth and the desire by regulatory authorities to introduce competition have offered opportunities for new entrants that have attempted to erode the profitability of incumbents. This allows the

distinction of different cohorts of entrants, depending on their order of entry, and the characterization of their competitive strategies. Importantly, previous research has shown the importance of first mover advantages (Eggers, Grajeck and Kretschmer, 2011; Gómez et al., 2016; Gómez and Maicas, 2011; Jakopin and Klein, 2012) and firm competitive behaviour (Fernández and Usero, 2009) in this industry. However, research has not integrated their analysis.

This paper contributes to the literature in several ways. Firstly, from a conceptual perspective, we provide a valuable integration between the order of entry and the competitive strategy literatures that expands our knowledge on first mover advantages (see, for example, Markides and Sosa, 2013). To answer this question is important for the findings of first mover advantages literature. If the order of entry were related to the competitive strategy followed by firms, first mover advantages could in fact be explained by the competitive strategy chosen. Therefore, at least a part of the effect attributed to order of market entry would be explained by competitive strategy. From an empirical point of view, this would suggest the need to control for this effect in the analysis of the order of entry-performance relationship. This should contribute to the understanding of the divergent results found in prior studies and to the comprehension of the way in which pioneers obtain competitive advantage. Accordingly, we adopt a configural approach to the study of order of entry advantage (Zachary et al., 2015) in which different cohorts of entrant have different optimal competitive strategies. To make this integration effective, we use the product lifecycle concept (Vernon, 1979) and we draw on the literature on diffusion of innovation among consumers (Rogers, 1995). The characterization of the competitive strategies chosen by each cohort of entrants will improve our understanding of how pioneers create value. Although we do not analyse performance in this paper, the discovery of a pattern in this relationship (i.e.

that entry order is related to competitive strategy) would suggest that first mover advantages depend on the competitive strategy chosen.

Secondly, although in this Chapter we do not analyse firm performance, the assessment provides new insights on the persistence of first mover advantages by examining how strategies evolve over time (Zachary et al., 2015). Taking advantage of the longitudinal nature of our dataset, we are able to analyse a firm's competitive behaviour throughout more than a decade of competition. By doing so, we address recent demands for enriched studies that take into consideration the dynamism of the competitive environment and the temporality of firms' advantages (Lieberman and Montgomery, 2013).

Finally, we also contribute to the literature on business strategies by studying the determinants of strategic choices and competitive positioning at the business level (Argyres et al., 2015). Dominant theories have considered the product lifecycle as an influential factor when defining suitable business strategies (for a review, see Hofer, 1975). This study proposes order of market entry as a central determinant of competitive strategy. This relationship is consistent with that followed by scholars using a contingency perspective (see Kerin et al., 1992; Szymanski et al., 1995).

The rest of the paper is structured as follows. In the next section, we provide a brief review of the relevant literature, paying special attention to the relationship between order of entry and competitive strategy. In the third section, we present our hypotheses. Section four defines the research setting and the variables. Finally, the last part of the paper describes the main results and highlights the key conclusions and suggestions for future research.

2.2. BACKGROUND TO FIRST MOVER ADVANTAGE AND COMPETITIVE STRATEGY

2.2.1. The literature on first mover advantage

Pioneering a market has been frequently proposed as a source of competitive advantage (Lieberman and Montgomery 1988). As a consequence, research on FMAs has attracted the attention of numerous scholars and different explanations of the findings have prompted a constant evolution of this literature in the last decades. Initial FMAs studies were unable to present conclusive evidence related to the effectiveness of order of market entry. While several papers supported the existence of FMAs (Lambkin, 1988; Mascarenhas, 1992; Szymanski et al., 1995), others showed inconclusive evidence or even rejected its existence (Golder and Tellis, 1993; Lilien and Yoon, 1990). The meta-analysis performed by Vanderwerf and Mahon (1997) shows that FMAs was detected in the majority of the studies. However, it also concluded that the results are largely dependent on certain characteristics, such as the selection of the industry by the researcher, the methods used and a lack of control for entrants' strength. The conflicting evidence and the need to disentangle the mechanisms creating FMAs have motivated the development of this line of research.

One of the first areas of investigation dealt with the “isolating mechanisms” that allow early entrants to protect themselves from competition (Day and Freeman, 1990; Rumelt, 1987). Although different classifications have been developed, the most widely accepted is that of Lieberman and Montgomery (1988). It distinguishes between technological leadership, pre-emption of scarce assets and buyer's switching cost. Based on this classification, several studies have empirically tested how the isolating mechanisms influence the relationship between order of market entry and performance (Bohlmann et al., 2002; Boulding and Christen, 2008; Gómez and Maicas, 2011). For example, Gómez and Maicas (2011) find that FMAs may be at least partly explained in terms of switching costs.

Bohlmann et al. (2002) demonstrate that pioneer advantages from pre-emption may not be so strong as to avoid later entrants' overtaking.

Research has also explored the macro and micro determinants of FMAs. These studies are motivated by the need to consider certain contingencies that may affect the boundary conditions of the theory and our understanding of the findings (Suarez and Lanzolla, 2007). On the one hand, researchers have used the ideas of the structure-conduct-performance paradigm (Bain, 1951; Mason, 1939) to analyse how factors such as market structure (Katz and Shapiro, 1992) or the degree of competition (Farrell and Saloner, 1985) may affect FMAs (for a review, see Fosfuri et al., 2013). Similarly, Suarez and Lanzolla (2007) have studied the role of market growth and technological change in explaining first mover advantages (see also Gómez et al., 2016).

On the other hand, research has also used the resource-based view (RBV) to identify firm-specific factors that could explain FMAs. A firm's resource strength will affect its ability to take advantage of pioneering (Franco et al., 2009; Mitchell, 1991). For instance, some studies argue that R&D capabilities may be associated with early entry (Robinson et al., 1992) and that both larger firms and firms with a superior level of international experience are often early movers (Gaba et al., 2002). Similarly, Hawk et al. (2013: 1533) find that firms with higher intrinsic speed capabilities—that is, greater ability to execute investment projects faster than competitors at the same cost—can wait longer to penetrate an emerging market without experiencing a negative influence in their expected post-entry performance. This line of enquiry emphasizes the importance of an alignment between the firm's relevant resources and capabilities and the order of entry to effectively obtain the benefits of entering in the first place.

Finally, scholars have proposed other contingences that allow followers to create an advantage and even surpass the pioneer (Fosfuri et al., 2013). This has led them to explore

the idea that the strategic orientation chosen by pioneers and followers may be different. This is important, because systematic differences in the strategies employed by pioneers and followers could explain some of the differences in performance found between them. Recent research seems to confirm this idea. For example, Shamsie et al. (2004) show that strategic positioning influences the capacity of late entrants to enter the market successfully. Similarly, Klingebiel and Joseph (2015: 1013) conclude that “strategy varies with entry timing” in their study of innovation strategies. Surprisingly, up to now this idea has received little attention. Markides and Sosa (2013: 325) highlight that “the literature does not explicitly consider either the strategy (or business model) that the pioneer uses to exploit FMAs or the strategy/business model that later entrants use to attack the pioneer as important determinants of the profitability of pioneering”. In this paper, we pay attention to this issue by considering the relationship between entry timing and competitive strategy. Additionally, we study the changes in pioneers’ strategy over time. Therefore, we address the “insufficient research on postentry strategies” and analyse the post-entry plans that pioneers develop (Zachary et al., 2015: 1408).

2.2.2. Order of entry and competitive strategy

A classic assumption in strategic management is that firm performance is critically determined by industry and firm factors (McGahan and Porter, 1997; Rumelt, 1991). Among the latter, the role of a firm’s strategy is one of the most important topics of study. In this paper, we explore the role of strategy in the context of FMAs. To do so, we focus on business level strategy, understood as the way in which a firm competes in a given business.

Several classifications of competitive strategy have been proposed (Abell, 1980; Hambrick, 1984; Miles and Snow, 1978; Mintzberg, 1988). However, Porter's (1980) taxonomy has been one of the most accepted within the field. Porter proposes two main routes to achieve sustainable competitive advantage: differentiation and cost leadership.

Firms that pursue differentiation strategies focus on creating products and services perceived as unique, for which considerable investments in design, quality or brand reputation are required. Firms following a cost leadership strategy aim at becoming the lowest cost producer in the industry. This implies continuous efforts focused on process cost reductions, diminution of distribution expenses and product cost minimization in areas such as R&D, customer service or advertising.

The two competitive strategies have traditionally been understood as mutually exclusive, the reason being that the set of resources and organizational arrangements needed to carry them out are basically incompatible. This has caused the emergence of an academic debate about the possibilities and potential benefits of employing either pure or mixed strategies (for a review, see Pertusa-Ortega et al., 2009). As a consequence, the literature has explored the importance of hybrid strategies that combine the positive elements of both differentiation and cost leadership to obtain a sustained advantage (Hill, 1988; Kim et al., 2004; Li and Li, 2008; Miller, 1992; Miller and Dess, 1993). This exploration has still not provided strong evidence of the supremacy of combined strategies in terms of firm performance. While Thornhill and White (2007) claim that strategic purity tends to perform better than hybrid strategies, the main results obtained by Spanos et al. (2004) confirm that hybrid strategies are not only more desirable than pure ones but are also more profitable, as the number of strategy components emphasized is increased.

In this paper, we argue that competitive strategies are determined by order of market entry and that they evolve over time. The integration of the literatures on FMAs and competitive strategy may benefit our understanding of the performance effects of competitive strategy. For example, the suitability of some strategies (differentiation, for instance) may depend on the ability of a firm to be the first in the market and to take advantage of certain isolating mechanisms. Similarly, other strategies (cost leadership, for instance) may be the

best alternative to compete in markets populated by differentiated competitors. This integration may also benefit our understanding of first mover advantages. In particular, pioneers may take advantage of a competitive strategy that exploits the isolating mechanisms to a higher extent. Similarly, their performance may suffer if they use a competitive strategy that does not fit with the prevailing market conditions at entry.

Despite the convenience of a better understanding of the determinants of competitive strategy and of the fit between pioneering and competitive strategy, the literature on this issue is scarce. Hofer (1975) presents several theoretical propositions that link the product lifecycle to business strategies. Research has also analysed competitive strategies in the context of entry timing. The interest has focused on (1) whether following a specific competitive strategy provides pioneers or followers with a greater sustainable advantage (De Castro and Chrisman, 1995; Durand and Coeurderoy, 2001; Fernández and Usero, 2009; Ruiz-Ortega and García-Villaverde, 2008); (2) the type of competitive actions that allow followers to erode a pioneer's advantage (Schnaars, 1994; Usero and Fernández, 2009); and (3) how pioneers react to the feasible erosion of their competitive advantage (Shankar, 1997). Extant research uses self-selected pioneers (De Castro and Chrisman, 1995), it is cross-sectional (Durand and Coeurderoy, 2001; Ruiz-Ortega and García-Villaverde, 2008), it focuses on firm actions and reactions, and not on strategy types (Fernández and Usero, 2009; Schnaars, 1994; Shankar, 1997; Usero and Fernández, 2009), and it does not study the evolution of business strategies over time. More recent research focuses on innovation strategies (Klingebiel and Joseph, 2015) rather than on competitive strategies. Given the shortage of research in this field, recent studies show an interest in developing a theoretical explanation about "who chooses which strategy" or what events generate certain strategic responses (Argyres et al., 2015: 221). Although Argyres et al. (2015) seek to address these concerns, their focus is exclusively on the follower's dilemma to strategically respond after an innovation shock. We

take a different perspective in which we focus on explaining entry and post-entry competitive strategies of pioneers vis-à-vis follower firms.

In conclusion, the literature on FMAs shows a lack of emphasis on entry and post-entry strategies (Zachary et al., 2015). In this paper, we adopt a configural approach to the study of first mover advantages that suggests that the choice of a specific competitive strategy is determined by the order of entry. Accordingly, we focus our analysis on an intermediate step within the classical relationship between order of entry and performance by studying the choice of competitive strategy.¹ Furthermore, going beyond the common understanding of entry as a punctual event, we consider its analysis as a dynamic process (Zachary et al., 2015). In this sense, the strategy employed by a pioneer may vary across time according to its experience and changing market conditions. For this purpose, we take advantage of the longitudinal nature of our database to study whether pioneer strategies vary depending on a firm's time in the market. The following section uses the basic tenets of the product lifecycle (Vernon, 1979) and the theory of diffusion of innovation among consumers (Rogers, 1995) to develop our hypotheses.

2.3. HYPOTHESES

2.3.1. Pioneers and followers use different strategies

To understand the choice of a given competitive strategy, we integrate innovation diffusion theory (Rogers, 1995) and the theory of first mover advantage (Lieberman and Montgomery, 1998). In particular, we argue that firms will choose the most adequate competitive strategy in terms of both the type of demand that they confront when they enter the market and the opportunities to take advantage of the isolating mechanisms.

Innovation diffusion theory provides a useful model to understand how consumers adopt innovations. There are two key insights that may contribute to our understanding of the

¹ Although both order of entry and competitive strategy may influence performance, in this paper we limit our attention to the relationship between order of entry and competitive strategy.

types of strategy pioneers use. The first is that the rate of adoption of an innovation varies over time according to a normal distribution (Rogers, 1995). In particular, when the innovation appears in the market, consumers do not have much information over its utility, and information spreading through social interaction is a slow mechanism, given the low numbers of initial adopters. Therefore, at least initially, pioneers have to deal with lower relative levels of demand and low adoption rates. Afterwards, if the innovation is accepted and information on it diffuses, the rate of adoption accelerates until the market approaches satiation.

The second insight is that the type of consumer is different depending on the time of adoption. Rogers (1995) classifies consumers into five categories: innovators, early adopters, early majority, late majority and laggards. Innovators and early adopters tend to be highly demanding, technologically educated individuals, less concerned with uncertainty and risk, and more willing to purchase and pay a high price to acquire new products, even when the technology's success is not fully guaranteed (Rogers, 1995). Since both categories of early consumer are characterized by enjoying higher socioeconomic status, they would have the available financial resources to acquire those higher-cost innovative products offered initially in the marketplace. If those early adopters are satisfied, they will act as reliable opinion leaders for the largest customer segments of the market.

At the same time, obtaining FMAs critically depends on the effectiveness of the isolating mechanisms. Researchers have conceptualized and classified the isolating mechanisms in several ways (Golder and Tellis, 1993; Kerin et al., 1992; Mueller, 1997). However, the most widely accepted is Lieberman and Montgomery's (1988) categorization into three types: technology leadership, pre-emption of scarce assets and switching costs/buyer choice under uncertainty. Our main argument is that firms will use a competitive strategy that guarantees the best fit with the isolating mechanisms most suitable to provide

them with a performance advantage, given prevailing market conditions (levels of demand, adoption rates and type of consumers). In our view, the differentiation strategy will be the one that offers an optimal fit for pioneers.

Differentiation strategies are consistent with both the creation of high switching costs and the characteristics of the demand in the initial stages of a market. The first product to hit the market receives “disproportionate attention in the consumer’s mind” (Lieberman and Montgomery, 1988: 46), which creates a preference for the product or service of the pioneer that converts into a higher willingness to pay. The literature on marketing psychology shows that the influence on preferences may be significant, with the first product hitting the market becoming the prototype of the category (Carpenter and Nakamoto, 1989). Additionally, given that customers are completely uninformed about valuable product features during the initial stages of market development, pioneers usually invest considerable marketing expenditure to educate potential users. Therefore, by achieving brand loyalty, customer recognition and even by becoming the prototype of the category, pioneers can establish cognitive entry barriers that protect from future market share erosion. At the same time, in the initial stages of the market, adoption by less risk averse consumers with a higher socioeconomic status may convert these benefits into profits.

The use of a differentiation strategy is also consistent with a second isolating mechanism, the pre-emption of scarce assets of superior quality. Since a restricted number of firms will be able to achieve a profitable position in most markets (Lieberman and Montgomery, 1988), pioneers may take advantage of their early entry through strategic selection of mobile and non-mobile assets. Regarding non-mobile assets, pioneers may disincentive competitors’ entry as a consequence of spatial pre-emption (Rao and Rutenberg, 1979). Selecting the most attractive niches to exploit, first movers will diminish profitable space through product and geographic expansion. It is expected that, in the initial stages of

development of a market, pioneers will show a preference to attract those users with higher socioeconomic status. Recent studies confirm that essentially high-quality pioneers—those with superior core technological experience—would be able to benefit from early entry by capturing the smaller but more demanding and profitable market segments (Eggers *et al.*, 2013).

Additionally, pioneers may be able to acquire or control valuable mobile resources such as the most skilled workforce, greater suppliers, a wide range of distribution channels, higher quality inputs, or the most advanced technologies. These assets provide services of a superior quality that may provide the basis for a differentiation strategy.

Finally, pioneers may benefit from taking advantage of technological leadership through learning or experience curve economies, and from their success in patent or R&D races. Although it could be argued that the first form of technological leadership (learning or experience curve economies) is consistent with a preference for a cost leadership strategy, the slow increase in market demand in the first stages of a new market makes this unlikely. Additionally, learning cost advantages seem not to persist over time. Several studies confirm that knowledge diffusion occurs rapidly in most industries and firm advantages derived from learning curves are difficult to sustain (Agarwal and Gort, 2001; Lieberman and Montgomery, 1988; Vidal and Mitchell, 2013). Moreover, the cost benefits from learning curve effects are conditioned by the stability of both technological progress and customers' preferences (Kerin *et al.*, 1992). Finally, even if a low cost position is viable, product differentiation may be an adequate strategy to achieve it by attracting customers and capturing a greater market share that creates scale economies and a strong costs position in the long run (Hill, 1988).

On the whole, these arguments allow us to propose the first hypothesis:²

Hypothesis 1: *Pioneers will be more likely to choose a differentiation strategy in their initial stages in the market compared to follower firms.*

2.3.2. Pioneers' strategies change over time

In hypothesis 1 we proposed that pioneers are more likely to follow a differentiation strategy than late entrants. Now we focus on how the strategy of the pioneer evolves over time. Research on the industry lifecycle shows that markets change over time by following a general pattern (see, for example, Keppler, 1997; Vernon, 1979). As markets mature, the development of a more competitive and demanding industry is highly probable and a change in pioneers' strategic positioning may be required. Therefore, our argument is that pioneers will need to reposition in order to cope with changing competitive demands. These changes would be motivated by a need to adapt to new market conditions, which may be due to the entry of new competitors and increasing pressure over costs, or to changes in the type of niche segments that pioneers must face. Under these circumstances, it is more likely that the pioneer modifies its strategy from differentiation towards a hybrid strategy rather than towards cost leadership over time (De Castro and Chrisman, 1995). There are several reasons for this.

Firstly, changing from a pure strategy to a hybrid one involves complementing the current competition base through the acquisition of new resources and the development of capabilities and certain skills not previously used. However, moving from a pure differentiation strategy to a cost strategy is much more risky, costly and unpredictable, given

² There are additional reasons why we should expect pioneers to use a differentiation strategy. Firstly, differentiation confers more flexibility to act strategically in the long run, and it also brings firms a specific and non-imitable basis of sustainable advantage to compete when a minimum cost position is achieved by competitors (Hill, 1988). Secondly, pioneering a market implies a significant investment and probably high initial fixed costs associated with entry. The investments in plant and equipment needed to create and maintain the infrastructure to operate will have to be compensated by a sufficient level of profits to cover such initial costs (Greenstein and Mazzeo, 2006). Accordingly, it seems reasonable to suspect that higher prices will be established to support initial loads and that a cost leadership strategy is less likely to be used.

that it involves a complete change of the set of capabilities the firm is using to compete (De Castro and Chrisman, 1995). It is important to bear in mind that the successful implementation of a strategy requires an alignment with different organizational elements including culture, structure and tasks. Accordingly, strategy renewal will require a change in these organizational elements, so that a fit between them and the strategy itself is achieved. Achieving this fit is not easy. Firms may find highly complex to obtain the new conditions, particularly the resources and capabilities necessary to carry out a radical new strategy. This makes the change from a differentiation to a cost strategy less likely. Considerable investment in differentiation can create rigidities. For example, a differentiation strategy can cause rigid cost structures. Organizational inertia may be another obstacle to engagement in radical strategy renewal (Gilbert, 2005).

Second, a combination of generic competitive strategies may be appropriate for firms to adapt to different environments and changing consumer demands (Booth and Philip, 1998; Miller, 1992; Pertusa-Ortega et al., 2009). In this context, it seems likely that pioneers would prefer to combine competitive decisions that show effectiveness in both strategic dimensions. This would allow pioneers to meet changing demands more successfully than pursuing a pure strategy. Particularly as the market evolves through the industry lifecycle and more competitors enter, the pressure over cost means that pioneers have to adapt their cost structures (Grant, 2015). If they have initially followed a differentiation strategy, as proposed in our first hypothesis, this means that they will also have to reduce their costs in order to cope with competition.

Third, having a multifaceted strategy makes it difficult for rivals to pinpoint and replicate (Booth and Philip, 1998). Thus, a more complex, creative, innovative and unknown combination of both cost and differentiation drivers may help firms to take a superior advantage and hinder competitors' imitation. Giachetti (2016) shows that the greater and

more complex a firm's strategic repertoire in terms of a wider range of different types of competitive action undertaken to outperform its rivals in the marketplace, the greater the likelihood of success.

Finally, as previous studies support, pioneers in growing and mature markets tend to be involved in the development of minor projects in preference to major ones (Robinson and Chiang 2002), such as incremental product innovations or line extensions, to maintain their differentiated position. Thus, although pioneers are consequently forced to invest a considerable amount of resources in R&D projects, the incremental nature of those improvements makes it possible to take advantage of its previous product development experience. Making use of benefits from learning curves, pioneers would be able to continue innovating while reducing manufacturing expenses along the product line.

Taking these arguments into account, we propose the second hypothesis:

Hypothesis 2: *Over time, pioneers will be more likely to follow a hybrid strategy.*

2.4. EMPIRICAL ANALYSIS

2.4.1. Data and sample

2.4.1.1. Research setting: mobile communications industry

In order to test our hypotheses, we draw on data covering all mobile network operators (MNOs) in the European mobile communications sector.³ The information to carry out the empirical analysis mainly comes from the GSMA Intelligence Database (2016), which provides quarterly information about MNOs along multiple dimensions such as market penetration, market share, revenues, coverage or technology launching dates of any participant in the industry (active, merged or closed). Additional information has been collected from press releases and operators' consolidated annual reports.

³ We consider the following countries: Albania, Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Montenegro, The Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

The mobile telecommunications industry is highly dynamic and characterized by rapid technological improvements. We focus the analysis on the period between the beginning of 2000 (or from the first point when an operator appeared if it entered at a later date) and the first quarter of 2016. This allows us to observe significant changes in terms of product evolution⁴ and competitive strategies. Regarding the latter, we are able to characterize the competitive strategies of all the firms competing in the market through three measures that capture the relative position of the different cohorts of entrant in terms of product quality, prices and costs. Importantly, the data allow us to observe the evolution of competitive strategy over time.

2.4.1.2. Variable description

Dependent variables

As Leitner and Guldenberg (2010) explain, there are diverse approaches to define a firm's competitive strategy as a result of the variety of variables and methods applied (see also Campbell-Hunt, 2000). While some authors use managers' perceptions (Bowman and Ambrosini, 1997; Kotha and Vadlamani, 1995; Spanos and Lioukas, 2001; Thornhill and White, 2007; Zahra and Covin, 1993), there are other scholars who use firms' investments or accomplished actions to capture their strategic conduct (David et al., 2002; Spanos et al., 2004; Wu et al., 2007). In this paper, we follow the latter approach. Therefore, our analysis is based on firms observed conduct, which determines (at least partially) the performance obtained.

In order to represent the competitive orientation of each firm, we use three general measures identified by prior studies as reflecting Porter's (1980) cost leadership and differentiation strategy. These measures capture relative quality, relative prices and relative operating efficiency.

⁴ In the analysed period, the telecommunications industry experienced important changes, basically as a consequence of the irruption of 3G and 4G. New competitive scenarios emerged and multiple technological opportunities allowed both incumbents and new entrants to take advantage of them.

Relative quality. Quality is generally associated with differentiation strategies (De Castro and Chrisman, 1995; Kotha and Vadlamani, 1995). Firms create consumer value and provide a sense of uniqueness by improving product attributes and by increasing the quality of the product offered. In contrast, firms pursuing cost strategies attempt to maintain a low quality gap with differentiation leaders while being the minimum cost producers in the industry (Porter, 1980).

Regarding the service offered, the mobile telecommunications sector has experienced considerable changes in terms of product characteristics and functionalities since its beginning (see GSMA Intelligence, 2014). Although the first generation (1G) only supported analogue phone calls, the second generation (2G) included digital phone calls, messaging and, for the first time, data services. However, limited data rates created difficulties in supporting the demand for related services (e.g. e-mail access). This was a critical issue that was solved by the third generation (3G), which offers improved data packages to achieve a superior Internet experience. Finally, the evolution from 3G to 4G services offers users access to substantially faster data rates and a reduction in the network latency. All in all, the incremental improvements modify how people make use of the services available on mobile devices.

To capture relative quality, we use three different measures (broadband speed, network coverage and technological standard breadth). *Broadband speed* is calculated as the sum of the download and upload speeds offered by an operator in megabits per second (Mb/s). We include this measure under the assumption that the higher the speed offered, the better the quality of the services provided to navigate. *Network coverage* is the total mobile coverage, expressed as a percentage of the total market population. The greater the coverage offered, the more likely it is that a user can call without connectivity errors (blocked calls because of heavy demand on the network), unexpectedly dropped calls (as a result of, for instance, users

moving into an area with limited mobile signal) or a reduction in the quality of navigation. Finally, we consider technological standards breadth (*TSBreadth*). Since the initial stages, incremental service improvements have been constant. In this sense, mobile operators tend to launch different sub-technologies within each technological generation (2G, 3G or 4G).⁵ These are aimed at improving service capability or adding some product functionalities. Therefore, *TSBreadth* counts the number of sub-technologies launched by a company and is understood as a signal of the company's commitment to provide high quality products to consumers.⁶

In order to capture the relative position of firm i at time t , each of the three variables (*Broadband speed*, *Network coverage*⁷, *TSBreadth*) was divided by its maximum value in each country⁸, in the following way:

$$Broadband\ Speedr_{it} = \frac{Downlink\ rate_{it} + Uplink\ rate_{it}}{Max(Downlink\ rate_{it} + Uplink\ rate_{it})}$$

$$Network\ Coverager_{it} = \frac{Network\ Coverage_{it}}{Max(Network\ Coverage_{it})}$$

$$TSBreadthr_{it} = \frac{TSBreath_{it}}{Max(TSBreadth_{it})}$$

Finally, to obtain a measure for quality, we build an index assuming the same importance for the three variables:

$$Relative\ Quality_{it} = \frac{1}{3}(BroadbandSpeedr_{it}) + \frac{1}{3}(Coverager_{it}) + \frac{1}{3}(TSBreadthr_{it})$$

⁵ In general, network technologies are aggregated into technological generations. For instance, technological standards such as LTE (long term evolution), LTE-Advanced or TD-LTE are commonly classified as 4G technologies. Each technological standard is seen as an evolution of a previous one and includes certain incremental improvements directed to upgrade the current services offered. For example, while LTE supports data rates of 100 Mb/s in the downlink and 50 Mb/s in the uplink, LTE-Advanced amplifies its capacity, supporting data rates of 3 Gb/s and 1.5 Gb/s, respectively.

⁶ We have assumed that each technology a firm incorporates is offered throughout the whole period.

⁷ The network coverage ratio is calculated by taking the newest technological generation available as the reference. That is, the coverage considered for those operators offering services in both 3G and 4G will be exclusively that offered in 4G.

⁸ It is important to note that, as the competitive orientation of each firm is measured in relation to that of its rivals, we need at least two firms to assess the competitive positioning of first-movers. As result, our analysis does not consider the period when the pioneer is a monopolist.

Therefore, higher values of this variable mean that the firm offers a higher quality than competitors and that the firm is closer to a differentiation strategy.

Relative prices. Comparing firms' and competitors' prices is one way to identify differentiation and costs strategies (Dess and Davis, 1984; Kotha and Vadlamani, 1995; Miller et al., 1989; Zott and Amit, 2008). Differentiation usually requires greater investments that are generally followed by high prices (De Castro and Chrisman, 1995). In contrast, firms with a cost orientation are able to maintain lower prices due to their ability to benefit from more favourable cost structures.

In our sector, the definition of homogeneous prices for the service offered is a controversial issue. The main reason is that mobile telecommunications services are multidimensional.⁹ This hinders the possibility of defining a homogeneous measure of mobile operators' prices, as opposed to other industries where prices could be perfectly compared in each product category. In order to solve this, studies on the mobile telecommunications industry employ different measures.

While Doganoglu and Grzybowski (2007) construct operator-specific price indexes from public information on the multiple tariffs offered by each firm, Grajeck (2010: 135) defines price as the "best-deal monthly bill" in terms of the lowest bill an average consumer must pay. Both calculate prices through the available information in a single country, but our study is international. To reduce the complexity of this exercise into simpler and more comparable measures, two dimensions may be identified as the most commonly used from an international perspective: the revenue per minute, or RpM (Maicas and Sesé, 2015) and the average revenue per user, or ARpU (Shy 2002). Although RpM might seem to be a better proxy for prices if the purchase decision is based on the per-minute cost assumed by the user,

⁹ Apart from diverse tariffs, which may differ depending on the time of day, prices tend to vary according to the characteristics of the receiver of the phone call, the usage of additional services such as short or multimedia messages, and the data packages hired.

ARpU shows the global cost of the multidimensional service offered (including additional information related to, for example, data services which are not priced in a per-minute basis).

Taking these arguments into consideration, we adopt the latter measure to study prices. As with quality, we build a measure of relative prices per country by dividing the quarterly ARpU of an operator by the maximum ARpU generated by competitors in the same period.

Relative operating efficiency. Finally, we capture the cost position of firms. Operating costs are usually considered to identify the firms following cost strategies (Dess and Davis, 1984; Zahra and Covin, 1993). Several studies have linked a cost leadership orientation with a minimization of product-related expenditures (Nayyar, 1993; Zott and Amit, 2008) and with a reduction in general operating cost (Thornhill and White, 2007).

We obtain the ratio of relative operating efficiency in two steps. Firstly, for each firm, we divide operational expenses by the total number of connections (subscriptions) registered on the mobile network.¹⁰ Secondly, in order to calculate the relative cost position, the ratio is divided by the maximum in the market. Therefore, the maximum value of this variable is 1. The greater the value of this ratio, the more inefficient the operator is and the further it is from a cost leadership strategy.

Independent variables

Order of entry. Different taxonomies have been employed to classify market entries. Golder and Tellis (1993) define the market pioneer as the first firm that enters a new product category. Similarly, Carpenter and Nakamoto (1989: 286) consider the pioneer as the first firm to introduce a “competitively distinct” product. In this vein, several authors have mentioned that the irruption of the second generation (2G) is the radical technological change experienced by the mobile telecommunications industry (Fuentelsaz et al., 2015; Gómez and

¹⁰ Instead of considering the number of unique users that subscribe to mobile services, we take into account the number of subscriptions (or registered SIM cards) on the mobile network, mainly because one user tends to have, on average, more than one SIM card.

Maícas, 2011). The enhanced services and devices linked to this technological innovation changed the way people communicate.

Taking into account the above arguments, we define a dummy variable that identifies whether a firm is a pioneer or a follower firm in each of the European markets considered. To codify this variable, we make use of information from the GSMA Intelligence Database, which reports operators' entry dates in each generation. Specifically, we create a dummy variable (*Pioneer*) that equals 1 when the operator enters into 2G first, and 0 otherwise.

Time in the market. In order to evaluate our second hypothesis, we define a continuous variable that measures how long a firm has been in a specific market (we count the number of quarters from entry). By doing so, we are able to evaluate changes in firms' strategies over time.

Control variables

We use seven control variables to capture the effect of other factors explaining the choice of competitive strategy. Firstly, the international dimension of this study requires the inclusion of *country dummies* to control for political, economic or social conditions that may affect a firm's competitive behaviour. Secondly, to control for rivalry, we include a variable that counts the *number of competitors* operating in each national market. We also include *year* and *quarter dummies* to assess time influences.

Additionally, we control for some firm-specific effects that could explain the competitive strategy selected. Firstly, some first movers were incumbents in the fixed line services and these two effects, pioneering and previous incumbency, should be clearly distinguished. To do this, we introduce a dummy variable (*incumbent*) that captures that the firm was previously established as an incumbent that provided fixed line services.¹¹ This

¹¹ Consumers might rely on the reputation of the former monopoly which enjoyed a leading and lonely position in the telecommunications sector during the previous decades. Furthermore, incumbent firms may make use of specialized assets and capabilities possessed by previous generations to enter a new product category (Mitchell, 1991) more effectively.

variable takes the value 1 if the firm provided fixed line services before the mobile telecommunications services appeared, and 0 otherwise. Secondly, we include the dummy variable *merger*, which identifies the resultant company after a merger or an acquisition process.¹² Finally, the dummy variable *part of a group* controls for possible advantages derived from previous international experience and from resource strength. This variable takes the value 1 if the firm belongs to an international group, and 0 otherwise.

2.4.1.3. Descriptive statistics

Table 2.1 shows the descriptive statistics and correlations of the variables used. The different availability of data for the three dependent variables makes the number of observations and the size of the sample used in each analysis different. The description of independent variables is based on the larger sample (the one used for relative prices).¹³ As can be seen in Table 2.1, the average number of operators in the market is 3.4. The average of the ratio of relative quality is 0.678. This means that on average the quality offered by operators in the market is, approximately, 67 per cent of that offered by the operator showing the highest quality. The average relative prices and relative operating efficiency are, respectively, 0.848 and 0.762.

¹² Firms would be more likely to modify their strategy as a consequence of two main factors: (1) opportunities arising from the acquisition of a new set of resources, capabilities and skills they are not used to competing with; or (2) the need to readjust past competitive routines and accommodate user conditions in the merged firm.

¹³ Descriptive statistics and correlations of the variables are similar in the other two samples.

Table 2.1. Descriptive statistics and correlations

	Obs.	Mean	St. Dev.	Min.	Max.	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]
[1] Pioneer	5,074	0.376	0.484	0	1	1								
[2] Number of competitors	5,074	3.416	0.806	2	5	-0.1042	1							
[3] Incumbent	5,074	0.298	0.458	0	1	0.2915	-0.1288	1						
[4] Merger	5,074	0.061	0.240	0	1	-0.0302	0.1260	-0.1199	1					
[5] Part of a group	5,074	0.803	0.398	0	1	0.1299	0.1166	0.0882	-0.0530	1				
[6] Relative quality	4,601	0.678	0.301	0.042	1	0.3313	-0.1350	0.3269	0.0284	0.3238	1			
[7] Relative prices	5,074	0.848	0.171	0.002	1	0.1795	-0.2253	0.0684	-0.0864	-0.0022	0.2930	1		
[8] Relative operating efficiency	1,281	0.762	0.239	0.011	1	0.0211	-0.2336	-0.1058	-0.0592	-0.0500	0.1325	0.3251	1	
[9] Time in the market	5,074	42.747	22.461	1	95	0.3995	0.1857	0.1818	0.1696	0.2859	0.4840	0.1393	-0.0739	1

2.4.2. Methodology

Given the censored nature of our dependent variables (relative quality, relative prices and relative operating efficiency), we use a Tobit model. The general model is specified as follows (Greene, 2008):

$$y_i^* = X_i\beta_i + \varepsilon_i$$

where y_i^* is a latent variable that is a function of a group of exogenous and control variables and of ε , the error term. The latent variable y_i equals the observed values when they exceed 0, and is censored at 0 otherwise:

$$y_i = \begin{cases} 0 & \text{if } y_i^* \leq 0 \\ y_i^* & \text{if } y_i^* > 0 \end{cases}$$

Considering the panel structure of the data (2000–2016), we estimate a random effects Tobit model.

2.5. RESULTS

Table 2.2 shows the results of a Tobit model that considers relative quality, relative prices and relative operating efficiency as dependent variables. The first three columns of Table 2.2 present the results of the estimation that uses relative quality as the dependent variable. Columns 4, 5 and 6 present the estimations for relative prices. Finally, columns 7, 8 and 9 present the estimations for relative operating efficiency. For each trio of columns, the first presents the baseline model, the second introduces the variable accounting for the order of entry, and the third considers *time in the market* and the interaction terms to assess the evolution of the strategy of pioneers. All the models are globally significant, as shown by the value of the chi squared. Collinearity diagnostics reveal that all variance inflation factors are below the recommended threshold of 10 (Marquard, 1970).

Table 2.2. Tobit estimates on relative quality, relative prices and relative operating efficiency

	Relative quality	Relative quality	Relative quality	Relative price	Relative price	Relative price	Relative operating efficiency	Relative operating efficiency	Relative operating efficiency
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Pioneer		0.231*** (27.17)	0.126*** (3.68)		0.0743*** (18.15)	0.212*** (18.47)		-0.000377 (-0.03)	-0.373*** (-7.63)
Time in the market (Q)			0.00678*** (19.56)			0.00224*** (13.31)			-0.00576*** (-11.26)
Time*Pioneer			-0.00108** (-2.11)			-0.00318*** (-16.28)			0.00779*** (9.31)
Number of competitors	-0.0198** (-2.41)	-0.0181** (-2.23)	-0.0146* (-1.76)	-0.0516*** (-12.08)	-0.0432*** (-9.97)	-0.0486*** (-11.53)	-0.184*** (-10.58)	-0.171*** (-10.26)	-0.184*** (-10.69)
Merger	0.0804*** (4.89)	0.0735*** (5.11)	0.0965*** (6.05)	-0.0656*** (-7.26)	-0.0451*** (-5.35)	-0.0562*** (-6.86)	-0.115*** (-5.38)	-0.120*** (-5.74)	-0.0979*** (-4.47)
Incumbent	0.283*** (31.11)	0.0913*** (10.73)	0.129*** (13.90)	0.0481*** (11.70)	0.0112*** (2.67)	0.00472 (1.14)	-0.0942*** (-7.76)	-0.119*** (-8.23)	-0.0503*** (-3.77)
Part of a Group	0.00178 (0.15)	0.0318*** (2.98)	-0.00272 (-0.22)	-0.0240*** (-4.26)	-0.0396*** (-6.78)	-0.0138** (-2.38)	0.0140 (0.70)	-0.0753*** (-3.75)	0.0666*** (3.07)
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.144*** (2.74)	0.189*** (3.97)	0.195*** (3.66)	0.926*** (53.24)	0.858*** (49.75)	0.884*** (52.16)	1.182*** (16.79)	1.262*** (18.08)	1.413*** (19.04)
N	4,601	4,601	4,601	5,074	5,074	5,074	1,281	1,281	1,281
chi2	1946.5***	3264.4***	2755.8***	2068.5***	5355.0***	2507.6***	895.4***	924.6***	748.1***
F-test vs. 1	.	738.36***	766.30***	.	329.37***	709.11***	.	0.00	160.39***
F-test vs. 2	.	.	382.66***	.	.	374.11***	.	.	158.98***

Note: t statistics in parentheses, * p < 0.10, ** p < 0.05, *** p < 0.01

In order to evaluate how pioneers compete in the market, we consider the second column of each dependent variable. For relative quality (column 2), the positive and significant coefficient of the variable *pioneer* ($\beta=0.231$; $p<0.01$) indicates that, on average, earlier entrants offer higher quality than later entrants over the period analysed. Regarding relative prices, the results presented in column 5 show that the coefficient of the variable *pioneer* ($\beta=0.0743$; $p<0.01$) is positive and significant. Both results are consistent with our expectations of first movers showing higher levels of differentiation in comparison with other entrants. Finally, the results for operating efficiency (column 8) show a negative but not significant coefficient of the variable *pioneer* ($\beta=-0.000377$; $p>0.10$). Therefore, no differences can be observed when examining competitors' average cost structures throughout the period. On average, pioneers emphasize quality and prices and do not suffer from a costs disadvantage.

Once the relative positioning of each cohort of entrants has been analysed, we focus on the third column of each dependent variable to test our hypotheses. Firstly, to evaluate the way first movers compete in the initial stages of our analysis, we must consider the direct effect of the variable *pioneer*. According to hypothesis 1, we would expect pioneers to present superior levels of relative quality and prices, while showing worse cost structures than followers. Secondly, to assess the variation of competitive strategies over time, we interact the variable *time in the market* and the dummy capturing the order of entry. A positive sign in the accompanying coefficient would imply that the firm enhances its relative position in terms of quality, prices and costs over time. A negative sign would imply the opposite. Hypothesis 2 proposes that pioneers would move towards hybrid strategies. Therefore, we would expect pioneers to keep their good positioning in terms of quality and prices, and to improve their costs position.

Regarding our first hypothesis, the results obtained for relative quality show that the coefficient of the variable *pioneer* ($\beta=0.126$; $p<0.01$) is positive and significant. As argued in hypothesis 1, pioneers are more likely to follow a differentiation strategy in comparison with other entrants when relative quality is considered. A second way to address hypothesis 1 is to explore differences in prices between the different cohorts of entrants. Those firms following a differentiation strategy generally keep prices high. The results presented in column 6 show that the coefficient of the variable *pioneer* ($\beta=0.212$; $p<0.01$) is positive and significant, which is consistent with our expectations. Finally, the results for relative operating efficiency are shown in column 9. Regarding our contention, earlier entrants should show lower relative operating efficiency levels in the initial stage of market development as a result of the substantial investments required. However, the coefficient of the variable *pioneer* ($\beta=-0.373$; $p<0.01$) is negative and significant, which means that, in general, first movers benefit from lower costs. This is an unexpected result that allows us to partially confirm hypothesis 1, since pioneers offer superior quality levels and charge higher prices, but they also seem to be more efficient than followers in the initial stage of the market development.

According to hypothesis 2, the results for relative quality show that the interaction of *time in the market* with *pioneer* ($\beta=-0.00108$; $p<0.05$) is negative and significant. This means that pioneers' quality position deteriorates over time vis-à-vis late followers. Similar results are found for relative prices. Column 6 presents a negative and significant interaction of *time in the market* and the *pioneer* dummy ($\beta=-0.00318$; $p<0.01$). Therefore, our estimations confirm that differences in prices between the pioneer and its competitors tend to decrease. Finally, column 9 shows how the cost position of the early entrants worsens over time, as the coefficient of the interaction term ($\beta=0.00779$; $p<0.01$) is positive and significant. Hence, although pioneers presented the lowest operating costs in the initial stages, their advantageous position is lost as time elapses.

In terms of hypothesis 2, the results on these dimensions do not allow us to accept our contention of first movers' strategic repositioning towards a hybrid strategy, since the pioneer competitive positioning seems to worsen over time in terms of quality, prices and operating efficiency levels.

Further analyses

Up to now, we have analysed the strategic positioning of pioneers vis-à-vis followers, considering the latter as a broad category. Nevertheless, research highlights the need to distinguish among latecomers to develop a deeper understanding of this category (Lieberman and Montgomery, 2013). A first reason is that followers may be heterogeneous in terms of the resources and capabilities that they control, and this may affect the way in which they compete (Hawk et al., 2013; Shamsie et al., 2004). A second reason is that the order of entry of followers is different, and this should influence the chance followers have to take advantage of market opportunities (Markides and Geroski, 2004) and to choose a business strategy. For example, some of the second entrants in the industry entered the market shortly after the pioneer.¹⁴ In this situation, market conditions could have been closer to those found by the pioneer than to those encountered by late followers.

Table 2.3 shows the estimations of an augmented model in which we distinguish between pioneers, second movers and late followers. The new variable (*second entrant*) equals 1 when the operator enters into 2G in second place, and 0 otherwise. The reason for adding just one category is that there are certain markets in which the maximum number of operators is three. To facilitate interpretation of the results, Table 2.4 predicts the relative quality, relative prices and relative operating efficiency for the average *pioneer*, the average

¹⁴ For instance, in the Hungarian market, we categorized as a pioneer the firm that penetrated the 2G market in March 1994 (Telenor) and as a second entrant the operator that entered the market in April 1994 (Magyar Telekom). In this case, there is an elapsed time of just one month between entries. Given this short period of time, we might consider that the two entrants would have had the chance of confronting similar market conditions and even of having equal opportunities to take advantage of the existing isolating mechanisms.

second entrant and the average *late follower*.¹⁵ When looking at the predictions for a given year, it is important to note that there are differences in *time in the market* among the categories of entrants. These have been considered by averaging *time in the market* for each category of entrants in a given year.

The results reinforce our conclusions in terms of the initial positioning of pioneering firms (hypothesis 1) and clarify prior findings regarding its evolution (hypothesis 2). Specifically, results presented in Table 2.4 show that pioneers are initially able to benefit from a hybrid strategy, since superior positions are obtained in terms of quality ($\beta_{Qp} = 0.7910$), prices ($\beta_{Pp} = 0.9331$) and cost efficiency ($\beta_{Op} = 0.8206$) than those of second entrants ($\beta_{Qs} = 0.5616$; $\beta_{Ps} = 0.8002$; $\beta_{Os} = 0.8671$) and late followers ($\beta_{Qf} = 0.4585$; $\beta_{Pf} = 0.7626$; $\beta_{Of} = 0.9198$). Nevertheless, the pioneer gradually loses its position as a cost leader. These findings also suggest that first mover advantage is eroded over time.

Having confirmed the main results, we turn to analysis of the positioning of second entrants and late followers. On the one hand, the results presented in Table 2.4 show that the second entrant gradually evolves towards a more advantageous position in the three dimensions considered. In fact, in the years considered in our observation window, they are able to improve their positioning from an intermediate position in terms of relative quality ($\beta_{Qs} = 0.5616$), prices ($\beta_{Ps} = 0.8002$) and efficiency ($\beta_{Os} = 0.8671$) to one that is close to a hybrid strategy ($\beta_{Qs} = 1.003$; $\beta_{Ps} = 0.9022$; $\beta_{Os} = 0.5098$). By the end of the period, the average second entrant is able to offer similar quality and price to first movers at significantly lower operating costs.

¹⁵ The different observation windows considered are due to the availability of data.

Table 2.3. The effect of pioneer and second entrant on relative quality, relative prices and relative operating efficiency (further analyses)

	Relative quality	Relative quality	Relative quality	Relative price	Relative price	Relative price	Relative operating efficiency	Relative operating efficiency	Relative operating efficiency
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Pioneer		0.342*** (31.15)	0.127*** (3.38)		0.150*** (29.21)	0.236*** (15.65)		-0.0300** (-2.01)	-0.179** (-2.51)
Second entrant		0.272*** (25.56)	-0.129*** (-4.10)		0.0927*** (18.54)	0.0473*** (3.79)		-0.0995*** (-6.61)	0.128** (2.19)
Time in the market (Q)			0.00281*** (5.61)			0.00331*** (11.25)			-0.00668*** (-8.81)
Time*Pioneer			0.00188*** (3.29)			-0.00423*** (-16.59)			0.00699*** (5.91)
Time*Second			0.00574*** (10.40)			-0.00157*** (-6.20)			-0.00143 (-1.29)
Number of competitors	-0.0198** (-2.41)	-0.0192** (-2.24)	-0.0203** (-2.44)	-0.0516*** (-12.08)	-0.0516*** (-12.13)	-0.0416*** (-9.34)	-0.141*** (-8.41)	-0.150*** (-8.71)	-0.127*** (-7.65)
Merger	0.0804*** (4.89)	0.0530*** (2.96)	0.0992*** (6.11)	-0.0656*** (-7.26)	-0.0381*** (-4.52)	-0.0420*** (-4.45)	-0.125*** (-6.03)	-0.0359 (-1.43)	-0.00806 (-0.38)
Incumbent	0.283*** (31.11)	0.117*** (12.30)	0.161*** (18.00)	0.0481*** (11.70)	0.00182 (0.43)	-0.0116*** (-2.71)	-0.0930*** (-7.82)	-0.0938*** (-7.61)	-0.0699*** (-5.64)
Part of a Group	0.00178 (0.15)	0.0188 (1.35)	0.0373*** (2.85)	-0.0240*** (-4.26)	-0.0172*** (-3.06)	-0.0365*** (-6.07)	-0.0900*** (-4.69)	-0.0146 (-0.55)	0.0223 (1.19)
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Quarter dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Constant	0.144*** (2.74)	0.133*** (2.69)	0.309*** (5.85)	0.926*** (53.24)	0.784*** (44.63)	0.796*** (35.82)	0.875*** (14.09)	0.801*** (10.28)	0.839*** (11.45)
N	4,601	4,601	4,601	5,074	5,074	5,074	1,174	1,174	1,174
chi2	1946.5***	3305.9***	3822.6***	2068.5***	2995.6***	2736.8***	722.8***	1462.2***	1275.2***
F-test vs. 1	.	1094.46***	1336.41***	.	854.39***	662.61***	.	48.95***	259.25***
F-test vs. 2	.	.	184.26***	.	.	351.55***	.	.	171.68***

Note: t statistics in parentheses, * p < 0.10, ** p < 0.05, *** p < 0.01

Table 2.4. Estimated predictive margins (further analysis)

Relative quality	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Pioneer (β_{Qp})	0.7910	0.8075	0.8265	0.8456	0.8646	0.8845	0.9031	0.9217	0.9402	0.9581	0.9783	0.9980	1.0163	1.0278
Second entrant (β_{Qs})	0.5616	0.5949	0.6287	0.6633	0.6964	0.7290	0.7627	0.7989	0.8340	0.8683	0.9020	0.9351	0.9693	1.003
Late followers (β_{Qf})	0.4585	0.4643	0.4687	0.4697	0.4681	0.4742	0.4848	0.4936	0.5039	0.5110	0.5192	0.5248	0.5315	0.5421

Relative prices	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Pioneer (β_{Pp})	0.9331	0.9298	0.9261	0.9225	0.9193	0.9157	0.9121	0.9083	0.9041	0.8998	0.8958	0.8920	0.8887	0.8852	0.8816	0.8779
Second entrant (β_{Ps})	0.8002	0.8055	0.8113	0.8180	0.8233	0.8306	0.8375	0.8444	0.8515	0.8607	0.8677	0.8750	0.8808	0.8867	0.8947	0.9022
Late followers (β_{Pf})	0.7626	0.7709	0.7827	0.7850	0.7955	0.8023	0.8072	0.8097	0.8129	0.8248	0.8354	0.8451	0.8523	0.8621	0.8743	0.8896

Relative operating eff.	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Pioneer (β_{Op})	0.8206	0.8220	0.8211	0.8246	0.8264	0.8278	0.8289	0.8300	0.8309	0.8321	0.8341	0.8352
Second entrant (β_{Os})	0.8671	0.8700	0.8923	0.8628	0.7668	0.7321	0.7033	0.6714	0.6525	0.6010	0.5370	0.5098
Late followers (β_{Of})	0.9198	0.9357	0.7896	0.8583	0.8270	0.8141	0.7945	0.7891	0.7768	0.7843	0.7513	0.7407

On the other hand, the strategic profile of the late followers is characterized by the lowest quality, the lowest prices and the highest costs. Over time, they improve their position in terms of operating efficiency, although this is not enough to become the lowest cost producer at the end of the period. It is also important to notice that they are the providers offering the lowest quality, but at a similar prices to the pioneers and second entrants. Overall, these results support prior conclusions and help to clarify our understanding of how the strategies of different cohorts of entrant evolve over time.

2.6. CONCLUSION AND DISCUSSION

The objective of this paper has been to study the role of entry timing in determining a firm's competitive strategy using a sample of European telecommunications companies. Our integration of the literatures on first mover advantages and competitive strategy led us to develop two hypotheses: firstly, that pioneers are more likely to choose differentiation strategies, given that they offer a better fit with demand characteristics and the isolating mechanisms proposed by the literature; and secondly, that the competitive strategy of pioneers evolves over time, moving towards hybrid strategies.

Two important conclusions can be drawn from the results obtained. Firstly, they show that pioneers are more likely to offer higher quality in their services and to charge higher prices than followers. Initially, pioneers also maintain low cost structures, benefiting from a better cost position than follower firms. Therefore, pioneers are initially able to implement hybrid strategies. Secondly, our results also lead us to conclude that their business strategy does not evolve towards a hybrid strategy. On the contrary, the results suggest that the value created is reduced as time goes by. Pioneers' advantage in terms of relative quality and prices diminishes, disappearing towards the end of the observation period, while their costs structure worsens in relative terms. This suggests that value creation is reduced over time and that

FMAAs tend to disappear, as some authors have suggested (Brown and Lattin, 1994; Lieberman and Montgomery, 1998).

These conclusions offer several theoretical implications. Regarding its importance for our understanding of the FMAAs literature, the contribution of this study is threefold. Firstly, our findings suggest that pioneers create value through alignment of the isolating mechanisms that are enabled by early entry and certain competitive strategies. More precisely, pioneers seem to take advantage of technological leadership, the pre-emption of superior resources and higher switching costs that allow them to offer more quality and to charge higher prices at the lowest cost.

Secondly, our results also suggest a role for competitive strategies in explaining the relationship between order of entry and performance. To benefit from the isolating mechanisms and to enjoy competitive advantages, pioneers have to choose the most adequate strategy. Our results suggest that those strategies that emphasize value provide pioneers with the opportunity to create a competitive advantage, at least in the short term. They also suggests that, in the long term, these strategies run the risk of being matched by early entrants that find their way into value strategies.

Thirdly, the results confirm that followers are able to reduce the competitive advantage obtained by first movers. Our results show that the pioneers' price gap and cost structure worsen over time vis-à-vis the situation of the followers. In particular, our findings confirm the importance of second entrants for competition. In this regard, we show that second entrants are able to improve their relative quality position more quickly than pioneers. Moreover, they suffer less from price erosion while becoming the most efficient participants in the industry over time. These results complement current understanding of how followers are able to erode a pioneer's advantage (Usero and Fernández, 2009), and suggest the need to follow a more granular approach in the study of followers.

In spite of these contributions, several issues should be considered in further analyses. Firstly, we have focused on the relationship between order of entry and competitive strategy. An analysis of firm performance seems to be the next logical step. In particular, the distinction between an order of entry effect and a competitive strategy effect on performance seems relevant. To study the extent to which following certain competitive strategies enhances the performance levels of a given cohort of entrants, or whether the order of entry effect is more (or less) important than competitive strategy in explaining variations in firm results, seems valuable.

Secondly, we have proposed entry order as the main determinant when deciding a competitive strategy. However, entry decisions could be based on a more complex relationship in which internal and external interrelated factors affect the possibilities each entrant has to compete, as some authors defend from the contingency perspective (e.g. Szymanski et al., 1995). In that regard, the specific resources and capabilities possessed by each firm (De Castro and Chrisman, 1995; Shamsie et al., 2004), or an appropriate fit between environmental opportunities and organizational strengths (Kerin et al., 1992), may condition the strategy implemented and the chance to obtain an advantage.

In line with the last point, the inverse of the relationship presented in this paper could also be addressed. In other words, researchers could explore to what extent the competitive strategy previously followed by a firm conditions the decision to enter a market by being an early entrant or a late follower. Firms will be most likely to follow a given entry timing strategy if their existing competitive strategy allows them to take advantage of economic opportunities in a certain market.

Moreover, the emphasis in the study on first movers may be overlooking relevant aspects of how their advantage is sustained or how it is eroded over time. Our results suggest that followers are heterogeneous enough in their competitive strategies to deserve a more

detailed analysis. We believe it would be interesting to delve into a nascent area of research that focuses on understanding the strategies pursued by different categories of follower firm (Fosfuri et al., 2013; Markides and Sosa, 2013) to penetrate the market and to benefit from late entry.

Finally, the industry studied is very interesting for our objectives. However, it is important to bear in mind that it is just one particular setting in which the theory of first mover advantages may be tested, and that it may have some peculiarities. For example, the strategic patterns discovered may be conditional to the industry. In order to generalize the results obtained, further analysis should seek to replicate this study in other settings. Similarly, data limitations precluded us from measuring intended strategies rather than realized strategies. For example, a late follower may attempt to follow a cost leadership strategy and end up being stuck in the middle as a consequence of the existence of second entrants that enjoy lower costs. This has to be taken into account when comparing our results with previous research. Data limitations also conditioned the selection of the three variables used in this paper and the fact that we did not use a synthetic measure of competitive strategies as other papers do (Pertusa-Ortega et al., 2009; Spanos et al., 2004; Thornhill and White, 2007). Further research into the link between order of entry, competitive strategy and performance in different settings may improve our understanding of the nuances of the relationship.

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Chapter 3.

HOW TO DEFEAT EARLY ENTRANTS:

The role of competitive strategy and industry dynamism on early mover advantages in the telecommunications industry

3.1. INTRODUCTION

Recent papers on first mover advantages (FMAs) have attributed an important role to firm competitive strategies (Zachary, Gianodis, Payne and Markman, 2015) and business models (Markides and Sosa, 2013). The main suggestion is that, to achieve competitive advantage, first-movers might use different strategies than followers. However, research on the relationship between order of entry, competitive strategy and competitive advantage is scarce (but see, De Castro and Chrisman, 1995, Durand and Coeurderoy, 2001 or Fernández and Usero, 2009). Moreover, as we explained in Chapter 2 of this dissertation, different studies have found opposite results when studying order of entry advantages and when analyzing the most appropriate strategy for each cohort of entrants to create value.

Along with this lack of consensus in the Academy, several scholars have brought back the debate of whether early mover advantages are sustainable over time (see Greve and Seidel, 2014; Lieberman and Montgomery, 2013; Suarez and Lanzolla, 2007; Tellis, 2014). For instance, Tellis (2014) reflects on the widely recognized importance of pioneering a market. While acknowledging the attractiveness of the concept, the author highlights that, in fact, first-movers are seldom able to sustain their competitive advantage in the long run. Contrarily, Greve and Seidel (2014) confirm that being early actually compensates for being worse. Moreover, they show that early moving is not only crucial, but that early mover advantages increase over time.

This discussion suggests the exploration of two ideas that we analyze in this paper. First, we study whether the use of a given competitive strategy (for example, differentiation vs. costs) is important or not for early movers advantages. Following the results of Greve and Seidel (2014), early entrants with lower quality could still earn a competitive advantage. However, as discussed in Chapter 2, previous research has argued that pioneers should use differentiation strategies if they want to profit from an early entry (De Castro and Chrisman

1995).¹ In this paper we move Chapter 2 forward by assessing whether the use of the competitive strategy that is presumed to offer an optimal fit with an early entry is the most profitable option for first movers. In particular, we propose that early movers should use differentiation-like strategies (i.e., differentiation and hybrid) rather than cost strategies. Similarly, we contend that a cost strategy is the best for those followers that want to close the performance gap that pioneers usually obtain.

Second, we study whether the early mover advantage is sustainable over time by taking into account how followers compete to defeat early entrants. Tellis (2014) argues that “a surge of later entrants learns from mistakes of pioneers, envisions opportunities and rides on the explosion of new superior technologies”. Moreover, Professor Tellis claims that pioneers “focus on the small initial market, failing to envision that vast mass market that they just opened up” (Tellis, 2014: A17). Both ideas suggest that the way each cohort of entrants capitalizes on shifting market opportunities will be important in the effective sustainability of early-movers advantages. Accordingly, our study pays special attention to the competitive behavior of followers and to the role that the evolution of the industry in which firms compete plays in the maintenance of competitive advantages. Following recent demands, we analyze how the joint effect of micro and macro aspects shapes each cohort of entrants’ profitability (Lieberman and Montgomery, 2013). Firstly, we reflect on the way certain competitive strategies favor follower firms to successfully enter new markets (Fosfuri, Lanzolla and Suarez, 2013). Secondly, our research proposes that the pace of industry dynamism (Suarez and Lanzolla, 2007) will affect the effectiveness of the strategies implemented by follower firms to erode early-mover advantages. In particular, we argue that, in contexts with greater market growth, the cost strategy will show higher effectiveness in eroding the competitive advantage of early movers. Conversely, in rapidly changing

¹ However, their results do not support this idea.

technology contexts, the effectiveness of the cost strategy will be weaker. In other words, we build on Suarez and Lanzolla (2007) and Gómez, Lanzolla and Maicas (2016) to integrate competitive strategies and market dynamism when studying the sustainability of the early-mover advantage. To our knowledge, this integration has not previously been explored in the context of first moving advantages.

We test our hypotheses on a panel data collected from the Wireless Intelligence Database. This study focuses on the European mobile telecommunication industry for the period 2006-2017. Our findings show the relevance of considering competitive strategies when explaining firm performance differences among each group of entrants. Competitive strategies seem to be less important for early entrants –they outperform late movers in all competitive scenarios²–, but their correct use is essential for followers. Moreover, the contextual environment-level dimensions play a key role in explaining the effectiveness of followers’ strategies in eroding early entrants’ advantages.

Our contribution to the entry-timing literature is twofold. First, we focus on the current debate around entry-timing advantages by considering the relevance of competitive strategies for early-movers’ and late entrants’ performance (Markides and Sosa, 2013). We adopt a configural approach and theorise in favour of an appropriate fit between a firm’s order of entry and the competitive strategy, as suggested by the literature (Zachary et al., 2015). This approach assumes that there is an optimal fit between order of entry and competitive strategies. However, it also considers that strategic misalignments may occur (Handley and Angst, 2015) and develops a comparative analysis to assess all the possible scenarios in terms of the match between competitive strategies and order of entry. To our

² Our study assesses the profitability of early movers and followers with each of the competitive strategies considered (i.e. differentiation like, cost leadership and stuck-in-the-middle). In that regard, we use the term “competitive scenarios” to refer to all the possible situations that can take place in a market regarding firms’ entry timing and the competitive strategy used. For instance, a situation in which an early entrant differentiates and followers use cost leadership refers to one competitive scenario, whereas a situation in which both cohorts of entrants differentiate refers to another. Overall, we develop a comparative analysis that contemplates a total of nine competitive scenarios.

knowledge, with the exception of De Castro and Chrisman (1995), there is no empirical evidence evaluating the most appropriate strategy for each cohort of entrants.

Second, our study advances research on the sustainability of early-mover advantages by exploring the impact of environmental dynamics on the effectiveness of followers' competitive strategy in FMA erosion. In that regard, our study does not focus exclusively on early entrants' behavior to create and maintain their advantages, but also on the way followers may successfully enter and compete (Fosfuri et al., 2013) regarding changing market conditions (Suarez and Lanzolla, 2007). The combination of micro and macro aspects in the same setting allows for a complete understanding of the effectiveness of different competitive strategies to obtain a sustainable competitive advantage. To our knowledge, this possibility has not been explicitly contemplated either theoretically or empirically, but it might be essential to offer a more nuanced picture of why early-entrants advantages might disappear, as the literature suggests (Lieberman and Montgomery, 1998, 2013; Tellis, 2014). Moreover, we offer scholars and practitioners novel insights about how changing environmental conditions impact the extent to which followers' strategies enhance the achievement of performance advantages (Fosfuri et al., 2013). This dynamic approach also responds to the call to study post-entry strategies (Zachary et al., 2015).

The rest of the paper is structured as follows. The next Section includes a brief literature review and reveals the opportunities for additional research that we have found. In Section 3, we present the hypotheses that relate order of entry, competitive strategy, industry dynamism and profitability. Section 4 presents the research setting, the variables and the methodology used. Finally, in Section 5 the empirical results are presented and in Section 6 we discuss the relevance of our key findings.

3.2. LITERATURE REVIEW ON ENTRY-TIMING ADVANTAGES

Despite decades of research, the analysis of the relationship between order of entry and performance has produced puzzling results (see Zachary et al., 2015 for a review). The discussion presented in the Introduction is perhaps the best reflection of this (please, see Greve and Seidel, 2014 and Tellis, 2014). One approach that has been followed to clarify prior findings has been to explore how competitive strategies influence the way in which each cohort of entrants competes and creates value. Following Porter's categorization (1980), scholars have generally distinguished between two main ways to achieve competitive advantages: differentiation and cost leadership³. Whereas the former emphasizes the need to offer unique and high-quality products to reach a superior position, the latter seeks to gain advantages over its rivals by becoming the lowest cost producer in the industry. Despite research carried out on this issue (please, see the discussion below), opposite findings have also been obtained and researchers have called for more research on the role of business models (Markides and Sosa, 2013) and competitive strategies on the performance of early and later movers (Zachary et al., 2015).

A concurrent suggestion from this literature is that differentiation may be the most appropriate path for pioneers to gain market share, improve profitability and to hinder prospective rivals' entry (Durand and Coeurderoy, 2001; Ruiz-Ortega and García-Villaverde, 2008). However, empirical studies fail to confirm this, as cost leadership is apparently as better as differentiation for first-movers (De Castro and Chrisman, 1995). Similarly, the competitive orientation for successful follower firms is far from clear. While competing on a low-cost basis seems to be the best option for followers (Coeurderoy and Durand, 2004; Covin, Slevin and Heeley, 1999; Fernández and Usero, 2009; Ruiz-Ortega and García-

³ Note that, together with the generic strategies, Porter coins the expression "stuck-in-the-middle" to refer to those firms that pursue the both differentiation and cost leadership, but fail to develop any of them. More recently, scholars have distinguished between firms that are stuck in the middle from those following hybrid strategies that successfully emphasize efficiency and differentiation (please see the literature review developed in Chapter 2).

Villaverde, 2008), several studies point at the use of differentiation actions, such as product innovativeness (Robinson and Chiang, 2002; Shamsie, Phelps and Kuperman, 2004), advertising efforts (Schnaars, 1994) or greater relative quality (Shamsie et al., 2004), as a suitable way to create competitive advantage and to catch up with pioneers.

In this paper we seek to tackle this still puzzling side of the entry timing literature by delving into the relationship between order of entry, competitive strategy and firm performance. A deterministic model would assume that all pioneers follow a specific strategy, different from that of followers (see Lambkin, 1988), as proposed in Chapter 2. In Chapter 2 this is justified in terms of the ability of each cohort of entrants to take advantage of the isolating mechanisms that prevail at entry. However, this fit (Kerin et al., 1992; De Castro and Chrisman, 1995) may be conditioned by other factors. First, each cohort of entrants will not necessarily have similar resources and skills, strategic objectives or decision-makers and, consequently, we should not expect a unique behaviour (De Castro and Chrisman, 1995; Shamsie et al., 2004). Second, as management scholars have recently pointed out, firms may make mistakes when competing in uncertain environments (Handley and Angst, 2015) and, as a result, they do not take optimal decisions. These misalignments would inevitably influence the achievement and sustainability of competitive advantages. By delving into the interplay between the order of entry and competitive strategies, this study aims to clarify the ambiguous evidence regarding performance differences at the firm-level.

In addition to this issue, Fosfuri et al., (2013) have recently pointed out that, despite its importance in the field of strategy, just a limited amount of studies analysed the role of the environment on the achievement and maintenance of entry-timing advantages. Some scholars have drawn attention to this matter by examining the effect of external contingencies on the analysis of entry-timing decisions and its effects (e.g. Lieberman and Montgomery, 2013; Suarez and Lanzolla, 2007; Zachary et al., 2015). In particular, industry dynamism has been

recently attributed a key role in explaining the sustainability of first movers advantages (Suarez and Lanzolla, 2007). The empirical evidence confirms that the pace of market growth and technology evolution have a detrimental effect on pioneers advantages (see, for instance, Gómez et al., 2016). Despite significant progress made on this issue during the last years, there are still open questions that need to be addressed (Zachary et al., 2015). In particular, the field lacks clarity about the external conditions that could affect the optimal fit between the order of entry and firm-based factors (i.e. resources and capabilities, strategy, business models).

Our paper seeks to address prior gaps by arguing that certain competitive strategies might have a different effectiveness in sustaining the entry timing advantages in different contexts. In particular, we mainly focus on the ability of latecomers to erode early entrants' advantages when different external conditions and competitive scenarios are considered.

3.3. HYPOTHESES

The review of the literature undertaken in the previous section shows that the fit between competitive strategy and order of entry is not well understood when firm performance is considered. It also suggests that certain competitive strategies could have different effectiveness when confronting various industry conditions and, therefore, when explaining the sustainability of early mover's performance. In this section we theorize on these two dimensions in order to extend the proposals of Chapter 2. First, we argue that differentiation like strategies are the ones that offer the best promise of performance advantages for early entrants. Second, we reflect on those competitive strategies more likely to be used by followers. Specifically, we examine those that offer the highest likelihood of eroding early movers' advantages when two key industry dynamics are considered: market growth and technological change.

3.3.1. Order of entry, competitive strategy and performance

Our first hypothesis proposes that differentiation like strategies (those that emphasize value rather than cost) are likely to generate the best performance for early-movers. The reasons have to do with the characteristics of early adopters, with the evolution of industries over time and with the isolating mechanisms. On the one hand, according to Rogers (1995)'s adopter categorization, two main types of consumers are identified during the first stages of market development. Firstly, those individuals labelled as *innovators*, which show greater willingness to pay for innovative and high standard products, even when they are surrounded by uncertainty. Secondly, the category of *early adopters*, which mainly consists of individuals who act as influencers or opinion leaders in most social communities. While *innovators* play the role of introducing new products into the social system, *early adopters* are responsible for reducing uncertainty and giving advice to the largest customers' segments. The two groups have substantial financial resources and enjoy higher social status. Moreover, they tend to use "the adoption of innovations as one means of getting there" (Rogers, 1995: 251).

On the other hand, the initial stages of market development are characterized by slow market growth (Levitt, 1965). This makes highly unlikely that first-movers can profit from costs reductions through scale economies (Agarwal and Gort, 2001). Additionally, the early stages of industry development tend to be characterised by uncertainty around product features and technology development (Day, 1981), which makes costs a secondary aspect when market competition is considered.

In this context, designing a strategy that emphasises the value of a firm's offering for consumers shows the best fit with the isolating mechanisms suggested by Lieberman and Montgomery (1988), namely, switching costs, technological leadership and pre-emption of scarce assets. The higher socioeconomic characteristics of first adopters, together with the

low market growth create opportunities to take advantage from the three isolating mechanisms. For example, first-movers may take advantage of first moving and of a temporary absence of competition to build a base of loyal customers and influencing their preference structure towards its product attributes (Carpenter and Nakamoto, 1989). This creates switching costs from which early entrants may extract a price premium. First-movers may also pre-empt superior quality assets to attend current demands by offering the best product to the most profitable customer niches (Lieberman and Montgomery, 1988). Similarly, they can gain advantage through technological leadership and use patent protected knowledge to design offerings with the best performance characteristics that may appeal to *innovators* and *early adopters*. This logic supports the idea that the use of differentiation strategies that attract the most profitable consumers is the most profitable option for first-movers.

One important observation is that, as markets mature, uncertainty is reduced and potential customers increase their willingness to acquire the new product. This is likely to have market growth and new entries as a consequence. However, the type of customers that follower firms will face when entering the marketplace is completely different from innovators and early adopters. According to Rogers (1995), the main categories of users that can be identified are, in this order, *early majority*, *late majority*, and *laggards*. As the innovation diffusion progresses in the social system, buyers tend to present lower risk acceptance levels, lower willingness to pay if success is not guaranteed and, in general, an inferior desire to acquire the newness. Given that adopters in more advanced stages of market development tend to see adoption as “an economic necessity and the answer to increasing network pressures” (Rogers, 1995: 249), a standardized product may be enough to satisfy maturity and traditional demands. Acquiring a standard-quality and low-priced product might be their goal, since they have more limited financial resources than early adopters.

Given the features of these new categories of users, it is likely that costs pressures increase as the market grows and that followers compete through a cost leadership strategy to capture the demand not willing to pay for the pioneers' offering or "previously uneconomic to serve" (Day 1981: 65). Although our contention is that all early-movers will suffer from competition as a consequence of increasing pressures over costs, those that are able to successfully combine positive elements of both differentiation, to preserve prior competitive advantages, and cost, to resist the increasing pressures over costs, are the ones more likely to sustain their competitive advantage. Stated differently, those differentiated early movers, capable of improving its cost efficiency levels as market grows, will enjoy greater advantages while protecting themselves from market share erosion (Pertusa-Ortega, Molina-Azorín and Claver-Cortés, 2009).

Taken together, all these arguments allow us to propose that the use of differentiation like strategies (differentiation and hybrid) is the most profitable option for early movers, whereas the cost strategy will be the optimal for followers. Accordingly, we state that:

Hypothesis 1a: *Early-movers following differentiation like strategies will obtain better performance than early-movers following costs strategies or being stuck in the middle.*

Hypothesis 1b: *Followers using cost strategies will obtain better performance than followers using differentiation like strategies or being stuck in the middle.*

3.3.2. The moderating role of industry dynamism

As for now, we have argued in terms of the most suitable competitive strategy to confer each cohort of entrants with a greater performance advantage when industries follow a typical development pattern. However, when analysing the persistence of entry-timing advantages, scholars have recently remarked the importance to consider a wider variety of external forces that may affect the ability of firms to achieve success, such as the evolution of

consumers' needs and technological and market changes (Fosfuri et al., 2013; Lieberman and Montgomery, 2013). In that regard, recent research on entry-timing literature reflects on the way the pace of evolution of environmental-level conditions may enable or disable the isolating mechanisms that give rise to early-mover advantages (Suarez and Lanzolla, 2007). Along with this theoretical approach, the influence of industry dynamics on the entry timing advantages has been empirically confirmed (Durand and Couderoy; 2001; Gómez et al., 2016). Nevertheless, to our knowledge, the joint effect of macro and micro aspects on the persistence of early entrants' performance advantages is unexplored. So, we seek to advance entry-timing advantage research by considering both followers' competitive behaviour and the influence of environmental contingencies as potential detrimental factors for early-mover advantages. We argue that certain environment-level conditions will affect the effectiveness of the competitive strategy that is assumed to be optimal for follower firms. In particular, our study focuses on analysing how effective a cost strategy is to reduce the performance gap of followers with early movers. To do that, we focus on the role of industry dynamism by examining the influence of the pace of market growth and technological change (Suarez and Lanzolla, 2007).

Market Growth

The pace of market evolution is generally characterized by presenting initial stages of low demand, followed by a period of rapid growth in which sales take-off, and a phase of maturity and decline (Levitt, 1965). As market grows and increases in demand take place followers will have a greater chance to successfully enter and meet emerging customer groups (Day, 1981). As previously suggested, the cost strategy will offer a better fit for followers to successfully compete with pioneers in an industry with a typical evolution. However, the pace of market evolution is suggested to significantly influence the effectiveness of the isolating mechanisms that give rise to early-entrants advantages (Suárez

and Lanzolla, 2007) and, consequently, the chance of later movers to successfully enter and reduce the performance advantage of the pioneer. Therefore, the pace of market growth might shape followers opportunities to benefit from a cost strategy. Accordingly, we suggest that the effectiveness of followers' cost strategy to erode early-entrants advantage will be conditioned by the pace of market evolution because of three main reasons.

First, the ability of a firm to pre-empt scarce assets has been identified as an effective driver to achieve early mover advantages. However, in contexts with a higher pace of market growth, the existence of enough resources (such as potential buyers, suppliers or distribution channels) for all potential entrants is guaranteed, facilitating followers' successful entry (Suarez and Lanzolla, 2007). In those environments, there will be a faster emergence of new sorts of consumers whose preferences (e.g., demand for low cost products), as previously noted, will significantly differ from those of innovators and early adopters (Rogers, 1995). Accordingly, we would expect later movers in contexts of high market growth to have more opportunities to meet a greater number of potential buyers demanding standardized and low cost products.

Second, a highly growing market would diminish early-mover advantages derived from learning curves since it allows later entrants to "travel along the experience curve more quickly" (Gómez et al., 2016: 268) and to benefit from economies of scale and scope. To the extent cost advantages are a function of firms' cumulative experience and market leadership (Kerin et al., 1992), rapid market growth will result in greater opportunities for followers to build a strong cost position in a shorter period of time.

Third, higher rates of market growth could disable switching costs that usually favor early-movers advantages. Potential entrants at initial stages of market development must deal with the fact that a broad portion of the market is already committed to the incumbent's product (Lieberman and Montgomery, 1988). However, in a context of high market growth,

the proportion of locked-in buyers will be notably reduced (Beggs and Klemperer, 1992). This means that the initial locked-in consumers, who show a better fit with the early entrant offering, will quickly reduce its weight on total demand as the new group of buyers appear on the market. Therefore, we expect that the chances of followers with a cost strategy to gain acceptance and erode early-entrants advantage will be higher when market growth is also higher.

Under these assumptions, our second hypothesis states that:

Hypothesis 2: The higher the market growth, the greater the effectiveness of the cost strategy used by a follower to erode early movers' advantages.

Technology evolution

Technology evolution refers to exogenous technical changes that shift the competitive marketplace by modifying the systems needed for producing outputs and creating value (Lavie, 2006). Technological discontinuities have been traditionally seen as a catalyst for market dynamism, since new opportunity windows arise for potential entrants after its emergence (Lee and Malerba, 2017). In that regard, Tellis (2014) reflects on how later movers may venture out the exploitation of new opportunities that arise from the appearance of superior technologies. Suarez and Lanzolla (2007) discuss how the pace of technology evolution may potentially enable or disable FMAs. Empirically, the evidence confirms the detrimental effect of technological changes on the persistence of early entrants' advantage (e.g. Bohlmann, Golder and Mitra, 2002; Gómez et al., 2016). Our study delves into this relationship, taking into account the way followers compete when explaining the erosion of early-movers advantages in contexts of technology evolution.

As argued in our hypothesis 1b, cost leadership seems to be the best competitive strategy for follower firms to achieve competitive advantages (see, for instance, Coeurderoy and Durand, 2004; Fernández and Usero, 2009; Ruiz-Ortega and García-Villaverde, 2008).

However, when environmental-level factors are considered, this statement seems to be subject to other nuances (Suarez and Lanzolla, 2007). In particular, it is argued that contexts of rapid technological change allow latecomers to invent around and compete with improved products. It seems that, in those contexts, they might have greater chances to benefit from superior quality products, which would be more close to a differentiation orientation. This leads us to consider that, in markets of high technology evolution, followers may take advantages from the development of a differentiation strategy as well as from a cost strategy. Therefore, we suggest that both versions complement each other to some extent since, although the cost strategy is preferred, it might not be as aligned with the external environment as in contexts with a slow technological change. Accordingly, our contention is that the effectiveness of the followers' cost strategy to erode early-entrants advantages will be lower in environments characterized by higher technology dynamism than in contexts where technology moves at a smooth pace. Our arguments are presented in more detail below.

It has been claimed that technology evolution could affect the chances of early entrants to sustain advantages from technology leadership (Bohlmann et al., 2002). For instance, a smooth pace of technology evolution usually favors first-movers, as later entrants have lower opportunities to challenge their competitive advantage by using improvements to differentiate their product (Suárez and Lanzolla, 2007). However, rapid technology environments reduce the effectiveness of patents in protecting innovations, giving later entrants greater possibilities to “invent around” (Lieberman and Montgomery, 1988) and come up with improved products to compete on differentiation.

A rapid pace of technology dynamism also creates uncertainty over the performance trajectories of new technical innovations within an industry (Bower and Christensen, 1995); thus creating greater difficulties for firms to preempt strategic assets such as technological resources or potential consumers (Suarez and Lanzolla, 2007). Prior studies state that first-

movers face greater disadvantages in markets when technology is advancing rapidly, especially if (i) they are unable to switch to the newer technology because of their economic or managerial commitment to the older one (Bohlmann et al., 2002); or (ii) they refuse to adopt the newness because it does not meet their current consumers demands (Bower and Christensen, 1995). In those contexts, followers will have the opportunity to benefit from advanced technologies that allow them to provide higher quality in their offerings to the new market just opened up. This means that the use of a differentiation oriented strategy (via improved products) could serve as an appropriate pathway for latecomers to overcome preemptive early-entrants advantages when technology evolves rapidly.

Switching costs derived from consumers' preference formation (Carpenter and Nakamoto, 1989) are also influenced by technology dynamism. In markets with a high pace of technological change, it is less likely that consumers will commit themselves to a learning-process of a single product, which may quickly become obsolete (Suárez and Lanzolla, 2007). In those contexts, later movers will meet a lower proportion of locked-in consumers, since uncertainty and skepticism about product benefits is expected to lower buyers' loyalty and commitment towards a unique product. As no product manages to become the prototype of the category, followers could find greater opportunities to establish a customer base through the differentiation of their new product attributes. Incumbent inertia and more rigid cost structures, on the other hand, may hinder early entrants from seeing the implementation of the newer technology as an attractive option (Bohlmann et al., 2002).

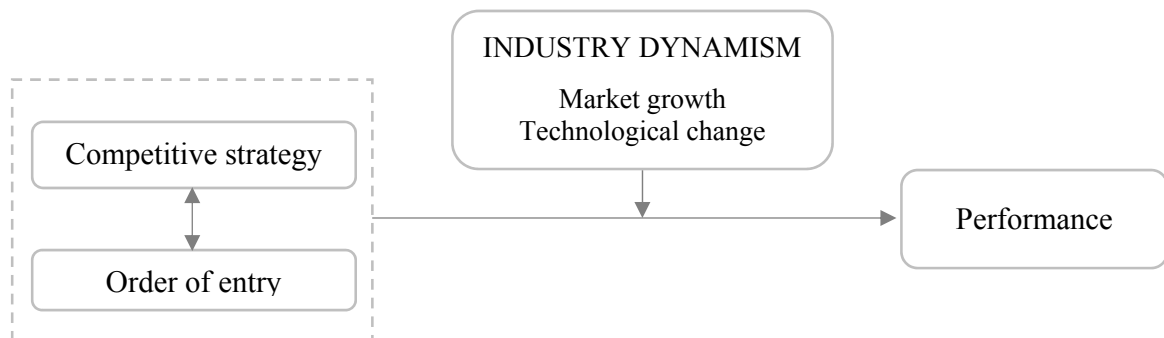
All in all, the arguments presented in this section suggest that a cost strategy will show an inferior alignment with the environmental conditions of an industry showing a rapid pace of technological change, and this should reduce the effectiveness of this strategy when used by followers. Therefore, our last hypothesis states that:

Hypothesis 3: *The higher the pace of technological change, the lower the effectiveness of the cost strategy used by a follower to erode early movers' advantages.*

In sum, our first two hypotheses propose the existence of an optimal fit between each cohort of entrants and certain competitive strategies to successfully compete in a stable marketplace. In particular, differentiation like strategies will offer early entrants a more profitable position, whereas the cost strategy will be the optimal choice for follower firms to compete when markets follow a typical development pattern. However, when an industry shows higher dynamism, our contention is that the effectiveness of the competitive strategy that is presumed to offer a better adjustment with follower firms will vary. Specifically, in contexts of high market growth, the cost strategy will be better aligned with the environmental conditions. Conversely, contexts of rapid technology evolution will offer a worse fit with followers cost strategies.

Our model of analysis is presented below in Figure 3.1.

Figure 3.1. Model of analysis



3.4. EMPIRICAL ANALYSIS

3.4.1. Data and Sample

3.4.1.1. Research setting: The mobile telecommunications industry

In order to test our hypotheses, we use longitudinal data of Mobile Network Operators (MNOs) in the European mobile telecommunication industry. Our multi-country sample

considers a total of 67 companies that operate in 18 markets⁴. The data used to develop the empirical analysis mainly comes from the GSMA Intelligence Database (2017), though additional information has been collected from the International Telecommunication Union, press releases and operators' consolidated annual reports.

3.4.1.2. Variable description

Dependent variable

Most traditional studies on FMAs have evaluated market share when assessing pioneer performance (Szymanski, Troy and Bharadwaj, 1995; VanderWerf and Mahon, 1997). Since using market share might influence the estimation of pioneer effects (VanderWerf and Mahon, 1997), scholars have stressed the importance of using profitability measures to evaluate first mover advantages (Lieberman and Montgomery, 1998). Accordingly, we use a firm's EBITDA (Earnings Before Interests, Tax, Depreciation and Amortization) as a dependent variable in our empirical test. Concretely, the GSMA Intelligence Database provides information on EBITDA on a quarterly basis, expressed as a percentage of the firm total revenues.

Independent variables

Order of entry

The variable *early entrant* identifies those firms that penetrate the mobile telecommunication industry in the initial stages of market development. It is important to note that, in the telecommunication sector, the emergence of a new industry took place with the shift from fixed to wireless technology (Fuentelsaz, Garrido and Maicas, 2015). Despite the first generation of mobile phones started to be commercialized in the late 1980s, it was not until the emergence of the Second Generation (2G) when the real take off of wireless technology took place and its diffusion process accelerated.

⁴ Our data set includes the following European countries: Austria, Belgium, Croatia, Finland, France, Germany, Greece, Ireland, Montenegro, Netherlands, Norway, Poland, Portugal, Serbia, Slovakia, Spain, Sweden and United Kingdom.

In this study, we take into account the mobile telecommunication service diffusion to categorize our order of entry variable. In particular, we defined an *early entrant* dummy that equals 1 if the adoption rate of the mobile technology is below 16 percent when the firm entered the market, and 0 otherwise. By classifying an early entrant in that way, we identify those first movers that meet innovators and early adopters when penetrating the mobile telecommunication industry (Rogers, 1995).

It is important to note that the highest rate of mobile adoption in the European markets took place during the last years of the 20th century (OECD, 2000). For instance, whereas in the early 1990s there was just one mobile subscriber per 100 inhabitants in Germany, the proportion increased up to more than 20 per cent by 1999. As the GSMA Intelligence database only offers information from the first quarter of year 2000, we use data collected from the International Telecommunication Union (ITU) to define our *early entrant* variable. In particular, we use the number of mobile-cellular subscription expressed as a percentage of the total population to identify the penetration rate of the mobile technology per market.

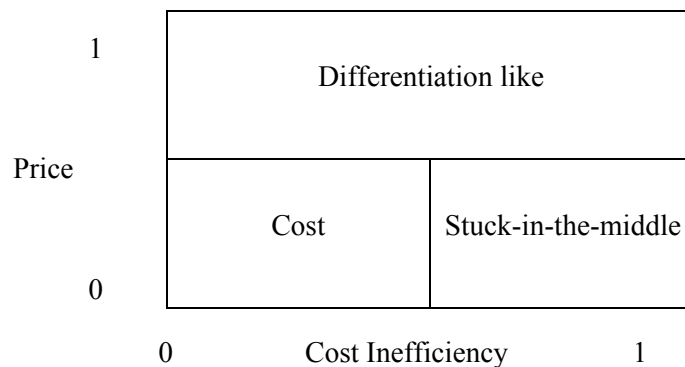
Competitive Strategy

Scholars in the management field have employed a wide diversity of methods to conceptualize firms' competitive strategies (see, for instance, Bowman and Ambrosini, 1997; Pertusa-Ortega et al., 2009; Spanos et al., 2004; Thornhill and White, 2007; White, 1986). In line with White (1986)'s study, we categorize competitive strategies using a two-dimensional chart, whose axes are price and cost inefficiency. According to Porter (1980), differentiation-oriented organizations are more involved in producing better quality products, which may be reflected by a higher customer willingness to pay (Lieberman et al., 2016). Thus, we link higher prices to a differentiation like strategy. On the other hand, firms following cost strategies fail to achieve high quality levels because their efforts are mainly aimed at diminishing product-related expenditures (Nayyar, 1993; Zott and Amit, 2008), while

improving general cost structures. Hence, firms following a cost orientation strategy will show a higher cost-efficiency.

Figure 3.2 distinguishes between three main competitive strategies: differentiation like (i.e. differentiation and hybrid strategies)⁵, cost leadership and stuck-in-the-middle. The “differentiation like” quadrant includes firms that maintain higher price levels than the market average. Firms in the “cost” quadrant show lower prices and a better cost structure and, finally, “stuck in the middle” firms have lower prices and lower cost efficiency levels⁶.

Figure 3.2. Competitive Strategy categories



Source: Own elaboration based on White (1986).

We should note that, in consistency with the meta-analysis of Campbell-Hunt (2000), we measured the axes variables relative to competitors in the market in the same period (Shamsie et al., 2004; Franco et al., 2009; Coeurderoy and Durand, 2004). Concretely, the ratio of *relative prices* per country is obtained by dividing the quarterly Average Revenue per User⁷ (ARpU) of an operator by the maximum ARpU generated by any competitor in the same period. Regarding the ratio of *cost inefficiency*, it has been obtained in two steps.

⁵ Note that White (1986)’s categorization distinguishes in separate quadrants between pure differentiation and hybrid strategies (those showing cost and differentiation advantages). Our contention is that, on average, the differentiation like strategy will offer a better fit with early movers than cost strategies or a stuck-in-the-middle position. Therefore, we consider these three broad categories of competitive strategies to test our hypotheses.

⁶ The stuck in the middle strategy is, by definition, less efficient than differentiation or cost leadership. According to Porter (1980), the firm that gets stuck in the middle is almost guaranteed low profitability as it fails to achieve cost advantages nor a high degree of uniqueness. However, it is important to realize that, given the categorization of the competitive strategies shown in Figure 3.2, there might be firms in a stuck in the middle position performing as well as cost leaders if both show cost efficiency levels close to the average value.

⁷ Shy (2002) uses the revenue per-subscriber as a proxy for prices in the cellular phone market.

Firstly, we have divided each firm operational expenses by the number total of connections (subscriptions) registered on the mobile network. Then, we calculated the relative cost position of each firm by dividing the value obtained by the maximum in the market. The greater the value of this ratio, the more inefficient the operator is and the further it is from a cost leadership strategy.

To classify the competitive strategy followed by a firm, we calculated the mean value of each ratio (*relative prices* and *cost inefficiency*) per country and quarter. Once the country-mean is obtained, we categorize the competitive position of each firm in relation to the national average⁸. A firm that presents values below the mean in both ratios will be labelled as a cost leader. The corresponding dummy, *cost strategy*, will take a value of 1 for that firm; otherwise, it will take a value of 0. Firms presenting values above the national average for relative prices are classified as differentiators and for these cases the dummy *differentiation like strategy* will take a value of 1, and 0 otherwise. Finally, firms that present values above the mean in the cost inefficiency ratio and below the mean in the case of the relative prices ratio are considered as firms with a stuck in the middle position. The corresponding *stuck in the middle* dummy will equal 1 for those firms, and 0 otherwise. Firms following a *stuck in the middle strategy* are used as the base case in our empirical analysis.

Industry dynamism

To evaluate how environmental contingencies influence the persistence of early movers' advantages, we use two main dimensions identified by prior studies as reflecting the industry dynamism: *market growth* and *technological change* (Suarez and Lanzolla, 2007). Both variables are measured at the market level. Regarding the former, our variable *market growth* measures the percentage variation in the number of mobile users in a market in

⁸ Note that the competitive strategy of each firm is defined per country and quarter in relation to the competitive position of its rivals in the market. Accordingly, we remove the observations of a country when there is no information for all the industry players at a given time.

comparison to the previous year. Specifically, we divided the number of new mobile users in a specific quarter by the total of mobile users in the year-ago quarter. On the other hand, the *technological change* variable counts the number of technological innovations that have taken place in the mobile telecommunication industry per country from the emergence of 2G until the second quarter of 2017. By identifying when a new technology is available in each market, this variable allows us to capture the pace of technological evolution per market at different times.

By way of clarification, it might be convenient to note that mobile technologies in the telecommunication industry can be described as technology standards that are traditionally aggregated into technological generations. Each of them is considered an evolution of the previous one, since it improves the service to a greater or a lesser extent. To define our variable of technology evolution, we have considered the technological changes that significantly upgrade the service offered and, consequently, the way people have benefited from their mobile phone service. According to the GSMA classification, the most important technological changes in the telecom industry have been, in this order, the change from GSM technology (commonly known as the Second Generation or 2G) to WCDMA (3G), the introduction of WCDMA-HSPA (3.5G), the change towards LTE (4G), and finally, the introduction of LTE Advanced (the upgraded form of LTE). On this basis, our technological change variable ranges from 0 to 4. Whereas 0 identifies environments characterized by a slow pace of technological change (the only technology available is GSM), a value of 4 identifies those markets presenting a higher pace of technology evolution (they have experienced the four technological changes considered).

Control variables

Apart from the variables described above, we also control for other factors. First, we define a set of *year dummies* and *quarter dummies* to assess any time-specific influences.

Second, we also include *country dummies* to control for contextual factors that might influence the implementation and effectiveness of firms' competitive strategies. Third, we count the *number of competitors* per country to control for competition in each period.

Finally, as previously done in Chapter 2, we control for possible firm-specific effects by including three dummy variables: *merger*, *part of a group* and *incumbent*. The variable *merger* equals 1 when the firm is the result of an acquisition or a merger process, and 0 otherwise. The *part of a group* dummy takes a value of 1 when an operator is majority-owned by a multinational telecommunication group; otherwise, it takes the value 0. Finally, we identify those firms that were previously established as an incumbent that provided fixed line services in a market through the variable *incumbent*. It takes the value 1 if the firm offered fixed line services before the mobile telecommunications services appeared, and 0 otherwise.

3.4.1.3. Descriptive Statistics

Table 3.1 presents the descriptive analysis and correlations of the variables considered to measure the empirical model. Our final sample includes a total of 1,025 observations for a period covering from 2006 to the second quarter of 2017. Overall, Table 3.1 shows that the correlation among all variables included in our model is moderate. As could be expected, the only exception is the negative relationship between the differentiation and cost strategy ($r=-0.747$). Besides, we can observed that EBITDA margin is positively correlated with an early entry, and with all the strategy variables considered.

Regarding the industry variables included in our model, Table 3.1 shows an average market growth of 0.032. This result reflects a slower pace of market growth than shown in prior studies developed within the mobile telecommunications industry (see, for instance, Gómez et al., 2016). In the case of the technological change, the mean of the variable is 2.387. This means that the degree of technology evolution in our sample is, on average, close

to advanced stages of the Third Generation (i.e. those in which the latest technological standard is the WCDMA-HSPA)⁹.

⁹ Please note that our variable *technological change* identifies with a value of 1 those periods in which the WCDMA (3G) is the newest technology in a given market. It equals 2, 3 and 4 when the introduction of WCDMA-HSPA (3.5G), LTE (4G) and LTE-Advanced have taken place, respectively.

Table 3.1. Descriptive analysis and correlations

Variable	Obs.	Mean	Std. Dev.	Min	Max	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]
[1] EBITDA margin	1025	0.207	0.574	-6.116	1.525	1.000									
[2] Early entrant	1025	0.625	0.484	0	1	0.305	1.000								
[3] Differentiation like strategy	1025	0.495	0.500	0	1	0.094	0.169	1.000							
[4] Cost strategy	1025	0.363	0.481	0	1	0.088	-0.045	-0.747	1.000						
[5] Market growth	1025	0.032	0.035	0.008	0.196	0.021	0.064	0.021	-0.041	1.000					
[6] Technological change	1025	2.387	0.708	0	4	-0.184	-0.089	-0.009	0.023	-0.403	1.000				
[7] Number of competitors	1025	3.551	0.677	2	5	-0.229	-0.105	0.111	-0.015	-0.183	0.353	1.000			
[8] Merger	1025	0.148	0.356	0	1	0.001	-0.017	-0.144	0.170	-0.157	0.350	-0.036	1.000		
[9] Part of a group	1025	0.854	0.354	0	1	0.209	0.193	0.007	-0.026	-0.036	-0.004	-0.140	-0.068	1.000	
[10] Incumbent	1025	0.276	0.447	0	1	0.170	0.370	0.004	0.015	0.013	-0.045	-0.074	-0.037	0.101	1.000

Tables 3.2 and 3.3 expand the descriptive analysis by examining whether there is a difference in average performance when both order of entry and the competitive strategy variables are considered. The information presented in Table 3.2 uses the whole sample, while Table 3.3 replicates the comparative analysis, first, for early entrants and, then, for follower firms.

For the whole sample, the results show that early movers obtain higher levels of EBITDA margin than their counterparts. Regarding the competitive strategies, Table 3.2 shows that a majority of firms use differentiation (507 of 1025), followed by those that use cost leadership (372 of 1025) and that are stuck-in-the-middle (146 of 1025), in that order. Table 3.2 also reveals that, on average, the differentiation like strategy allows organizations to obtain an average profitability of 26.2%, while firms following a cost leadership or get stuck obtain an average EBITDA margin of 15.4%. Similar results are found when analysing the mean performance of firms identified as cost leaders, which obtain a higher performance than the average of the firms following a differentiation strategy and that are stuck in the middle. As expected, stuck in the middle is the strategy reporting the lowest levels of EBITDA margin (-15.4%), when compared to the other two categories of competitive strategies.

Table 3.2. Firm performance by order of entry and competitive strategy

	Group	Obs.	Mean EBITDA	t
Early entrant	0	384	-0.019	-10.25***
	1	641	0.343	
Differentiation like strategy	0	518	0.154	-3.03***
	1	507	0.262	
Cost Strategy	0	653	0.169	-2.83***
	1	372	0.274	
Stuck-in-the-middle strategy	0	879	0.267	8.47***
	1	146	-0.154	

***, **, * Statistically significant at 1%, 5% and 10% levels, respectively.

Similarly, the results in Table 3.3 show that following a stuck in the middle strategy provides the lowest performance levels for all companies regardless of their order of entry (an average EBITDA of 32.3% for pioneers and -48.5% in the case of followers). No significant

differences are found in early movers' profitability, neither with a differentiation nor with a cost strategy. However, the results differ in the case of followers. In particular, latecomers seem to profit more, on average, if they compete through a cost leadership (16.2%) rather than a differentiation or a stuck-in-the-middle strategy (-13.5%).

We also observe that, as expected, more than a half of early movers follow a differentiation strategy (359 out of 641), whereas the cost leadership seems to be preferred for followers. However, in the case of the latter, there is almost no difference with those who choose to pursue a differentiated positioning (150 are cost leaders vs. 148 followers that differentiate).

Table 3.3. Entrant's performance by competitive strategy

	Group	Obs.	Mean EBITDA	t
Early entrants subsample				
Differentiation like strategy	0	282	0.344	0.33
	1	359	0.342	
Cost Strategy	0	419	0.339	-1.58
	1	222	0.350	
Stuck-in-the-middle strategy	0	581	0.345	2.02**
	1	60	0.322	
Followers subsample				
Differentiation like strategy	0	236	-0.074	-1.53
	1	148	0.068	
Cost Strategy	0	234	-0.135	-3.24***
	1	150	0.162	
Stuck-in-the-middle strategy	0	298	0.115	5.76***
	1	86	-0.485	

***, **, * Statistically significant at 1%, 5% and 10% levels, respectively.

Finally, Table 3.4 shows a first approach to evaluate how industry dynamism may influence entrants' profitability in our research setting. The effect of competitive strategies is not considered, but the findings are interesting. We can see that, on average, early movers present greater levels of EBITDA margin than followers regardless the pace of industry dynamics. Unexpectedly, they seem to show even superior performance differences in contexts of greater market growth, contradicting prior evidence on the detrimental effect of

market growth on FMAs (Gómez et al., 2016). We further explore this unexpected result in Section 5.

Table 3.4. Firm performance by order of entry and industry dynamism

		Early entrant	Obs.	Mean EBITDA	t
Market growth	High (above the mean)	0	113	-0.118	-10.52***
		1	249	0.370	
	Low (equal or below the mean)	0	271	0.022	-6.32***
		1	392	0.326	
Technological change	High (above the mean)	0	149	-0.151	-4.89***
		1	179	0.306	
	Low (equal or below the mean)	0	235	0.065	-11.54***
		1	462	0.357	

***, **, * Statistically significant at 1%, 5% and 10% levels, respectively.

3.4.2. Methodology

In this paper, we use a random effects panel data model. The main reason is that we have a time invariant variable (e.g., the one representing the early entrants) and other variables with small variations over time (e.g., the ones representing the three competitive strategies). Therefore, in this setting the fixed effects model would not show information on the variables of interest. Additionally, the fact that we have a cross-sectionally dominated data in which random effects tend to perform better than fixed-effects regression is another reason to use this model (Certo and Semadeni, 2006; Holmes et al., 2013).

3.5. RESULTS

Table 3.5 presents the results of estimating a random-effects regression over our sample. As can be seen in Table 3.5, the first column presents the baseline model, which considers the influence of the control variables. Column 2 includes the dummy of the *early entrant* to analyse order of entry effects on firm performance. In Column 3, the competitive strategies followed by firms are considered. Finally, Column 4 includes the interaction effect between the *early entrant* dummy and the competitive strategies defined to test our first hypotheses (H1a and H1b). All the models are globally significant and collinearity

diagnostics reveal that all variance inflation factors are below the recommend threshold of 10 (Hair, Anderson, Tatham and Black, 1995; Marquardt, 1970).

First of all, results in Column 2 confirm that entering first a market has a positive effect on profitability, as the coefficient of the variable *early entrant* is positive and significant ($\beta=0.405$; $p<0.01$). This means that the order of market entry is a significant predictor of firm profitability and, consequently, it supports the evidence found in prior studies regarding the existence of FMAs in the mobile telecommunication industry (Bijwaard, Janssen and Maasland, 2008; Gómez and Maicas, 2011; Japokin and Klein, 2012).

Table 3.5. The effect of order of entry and competitive strategy on profitability

	(1)	(2)	(3)	(4)
Early entrant		0.405*** (4.62)	0.370*** (4.61)	0.503*** (5.22)
Differentiation like strategy			0.149*** (4.34)	0.193*** (3.83)
Cost strategy			0.156*** (4.37)	0.261*** (5.14)
Early entrant*Differentiation				-0.124* (-1.68)
Early entrant*Cost				-0.220*** (-2.87)
Number of competitors	-0.0227 (-0.84)	-0.0211 (-0.77)	-0.0291 (-1.02)	-0.0227 (-0.77)
Merger	0.0301 (0.57)	0.0282 (0.53)	0.0301 (0.56)	0.0477 (0.88)
Part of a group	0.167** (2.29)	0.125* (1.70)	0.170** (2.33)	0.203*** (2.78)
Incumbent	0.236** (2.39)	0.0811 (0.84)	0.0859 (0.98)	0.0861 (1.05)
Country dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
Quarter dummies	Yes	Yes	Yes	Yes
Constant	0.122 (0.59)	-0.0257 (-0.13)	-0.110 (-0.58)	-0.196 (-1.03)
<i>N</i>	1,025	1,025	1,025	1,025
chi2	104.1***	136.7***	178.3***	202.0***
F-test vs. 1	.	21.36***	47.44***	59.04***
F-test vs. 2	.	.	23.00***	32.53***
F-test vs. 3	.	.	.	8.21**

***, **, * Coefficient statistically significant at 1%, 5% and 10% levels, respectively.

This entry-order effect remains positive and significant in Column 3, where the variables capturing the competitive strategy are included. Both strategies, *differentiation like* ($\beta=0.149$; $p<0.01$) and *cost leadership* ($\beta=0.156$; $p<0.01$), provide firms with higher profitability than being stuck in the middle. However, no differences are found for the comparison of differentiation and cost strategies ($\text{Chi}2(1)=0.05$; $p>0.10$). This means that competitive strategies, on their own, do not explain differences on firms' profitability. Therefore, these results would be in line with our contention about the importance to jointly analysing the effect of the order of entry and competitive strategies to explain firms' performance differences.

The effect of competitive strategy on early movers and followers advantages

Column 4 incorporates the interactions between the *early entrant* dummy and the competitive strategies defined. The interactions effects are negative and statistically significant in all cases. To facilitate the interpretation of the results, we predicted firm performance for early movers and followers in different scenarios¹⁰.

To this aim, we predicted EBITDA margin using the full model presented in Table 3.5 (Column 4) and compared the predictions for the different categories of entrants and the different competitive strategies followed. More precisely, we followed a two-stage procedure. First, we estimated the prediction of the average EBITDA margin for each group of entrants with different competitive strategies. For instance, the predicted EBITDA for an early entrant with a differentiation strategy is 0.321, whereas cost leadership leads early movers to obtain an EBITDA of 0.293. Second, we compared the results obtained in the first stage to confirm whether there are significant differences between the predicted performance levels. We can see that the performance differences between first-movers with a differentiation or a cost

¹⁰ We used STATA "margins" command to predict firm performance in the competitive scenarios considered and "margins, pwcompare" to make pairwise comparisons of EBITDA margins.

strategy are non-significant (please see Table 3.6, $\beta=0.028$; $p>0.10$). The results of the comparative exercise are presented in Tables 3.6 and 3.7.

Table 3.6. Profitability of firms in the telecommunication sector (strategy comparison)

	Difference in EBITDA Margin	Std. Err.	z
Early entrant			
Differentiation like vs. Stuck	0.0690	0.0536	1.29
Differentiation like vs. Cost	0.0280	0.0362	0.77
Cost vs. Stuck	0.0410	0.0565	0.73
Follower			
Differentiation like vs. Stuck	0.1932	0.0504	3.83***
Differentiation like vs. Cost	-0.0674	0.0562	-1.20
Cost vs. Stuck	0.2606	0.0507	5.14***

A first interpretation of hypothesis 1a is that early entrants are better off by following a *differentiation like strategy* than any of the other options. The top rows of Table 3.6 compare the profitability of early movers with different strategies. As can be seen, no significant differences are found when analysing early entrants' strategic behaviour. These results support those that defend that early movers are able to gain competitive advantage due to first moving and regardless of the competitive strategy used (e.g., Greve and Seidel, 2014). This analysis does not support hypothesis 1a.

According to hypothesis 1b, we would expect followers performing better with a cost leadership rather than a differentiation strategy or a stuck-in-the-middle position. In this case, two of the comparisons in Table 3.6 are significant, showing that followers obtain a worse performance when they are stuck in the middle. The highest differences with the stuck in the middle strategy are obtained when followers use a cost strategy ($\beta=0.2606$; $p<0.01$) rather than a differentiation one ($\beta=0.1932$; $p<0.01$), which is in line with our hypothesis 1b. Yet no significant performance differences are found between these two competitive strategies for latecomers ($\beta=-0.0674$; $p>0.10$).

A second interpretation of hypotheses 1a and 1b is that, to know the best competitive strategy for each cohort of entrants, we have to compare their profitability with that of their rivals. The results presented in Table 3.7 compare the profitability of early and late movers

with the three strategies considered. Overall, the results in Table 3.7 confirm that any competitive strategy followed by early entrants outperforms followers. As it could be expected, the greatest differences between the performance of early movers and followers are found when the latter get in a stuck-in-the-middle position, being the *differentiation like* strategy the most profitable for early entrants in that situation ($\beta=0.5717$; $p<0.01$).

Table 3.7. Profitability of firms in the telecommunication sector (early entrant vs follower)^a

			Difference in EBITDA Margin	Std. Err.	z
Early entrant (D)	vs.	Follower (D)	0.3785	0.0805	4.70***
Early entrant (D)	vs.	Follower (C)	0.3111	0.0818	3.80***
Early entrant (D)	vs.	Follower (S)	0.5717	0.0825	6.93***
Early entrant (C)	vs.	Follower (D)	0.3506	0.0842	4.17***
Early entrant (C)	vs.	Follower (C)	0.2832	0.0863	3.28***
Early entrant (C)	vs.	Follower (S)	0.5437	0.0866	6.28***
Early entrant (S)	vs.	Follower (D)	0.3096	0.0943	3.28***
Early entrant (S)	vs.	Follower (C)	0.2421	0.0954	2.54**
Early entrant (S)	vs.	Follower (S)	0.5027	0.0962	5.22***

^a(D) Differentiation like strategy; (C) Cost strategy; (S) Stuck-in-the-middle strategy.

Moreover, we can observe that, on average, early entrants always benefit from a more advantageous position if follower firms got wrong and use a competitive strategy which, at least theoretically, does not offer the best fit with their order of entry. In particular, superior differences are found between those early movers that use differentiation against differentiated followers ($\beta=0.3785$; $p<0.01$).

Despite the fact that differentiation offers early entrants a higher advantage, alternative strategies seem to work too. When both type of entrants fail to develop the strategy expected to be optimal, early entrants surpass followers' profitability ($\beta=0.3506$; $p<0.01$). Furthermore, when competition is based on a cost leadership strategy, early movers also outperform followers, though the performance difference gets reduced in this case ($\beta=0.2832$; $p<0.01$).

Overall, although the differentiation strategy offers early movers good performance positions, there are other strategies that offer good results. For instance, a cost leadership strategy, if the follower differentiates, offers early movers a superior advantage ($\beta=0.3506$; $p<0.01$) than if both pursue its optimal strategy ($\beta=0.3111$; $p<0.01$). Accordingly, we cannot

confirm our hypothesis 1a as the competitive strategy followed by first-movers seems to not be as much determinant as expected. Again, the evidence for early entrants indicates that the order of entry explains to a greater extent the competitive advantages obtained by first-movers than the strategies do.

In the case of followers, however, the results confirm that their choice is important to reduce early mover advantages. Though no strategy allows them to be better than early entrants, it seems clear from Table 3.7 that the lowest differences between first and later movers profitability are found when followers use cost leadership. In those situations, latecomers are able to reduce to a greater extent the performance gap with early movers. This is the case when the later are in a stuck-in-the-middle position ($\beta=0.2421$; $p<0.05$), follow a cost leadership strategy ($\beta=0.2832$; $p<0.01$) or differentiate ($\beta=0.3111$; $p<0.01$), in that order. This gives support to Hypothesis 1b.

The effect of industry dynamism on the effectiveness of followers' competitive strategy

Once the fit between the order of entry and the competitive strategy has been analyzed, we move forward to the second part of our analysis to test whether industry dynamism moderates this relationship. In particular, we analyze the effectiveness of followers' competitive strategies when the variables *market growth* and *technological change* are included in the model. To this aim, we identified follower firms by defining the dummy *follower* as the opposite of the *early entrant* variable. In this case, *follower* takes the value 1 whether the adoption rate of the mobile technology is above 16 percent when the firm penetrates the market, and 0 otherwise.

In order to test Hypotheses 2 and 3, we must go through Tables 3.8, 3.9 and 3.10. Table 3.8 presents the results of the random-effects regression. In particular, Column 4 shows the full model specification once the variables referred to firms' order of entry, competitive strategies, industry dynamism and their interactions are considered. As done in Hypothesis 1a

and 1b, we predicted firm performance for early mover and followers to facilitate the interpretation of the results presented in Column 4 (see Tables 3.9 and 3.10).

Table 3.8. Followers' competitive strategy and industry dynamism

	(1)	(2)	(3)	(4)
Follower	-0.405*** (-4.62)	-0.370*** (-4.61)	-0.361*** (-4.51)	0.892*** (3.19)
Differentiation like strategy		0.149*** (4.34)	0.154*** (4.60)	0.100 (0.42)
Cost strategy		0.156*** (4.37)	0.159*** (4.57)	0.0392 (0.16)
Market growth			-2.731*** (-5.55)	-0.647 (-0.26)
Technological change			-0.0943** (-2.38)	-0.0264 (-0.32)
Follower*Differentiation				-0.841*** (-2.85)
Follower*Cost				-0.857*** (-2.79)
Follower*Market growth				-7.391*** (-2.87)
Differentiation*Market growth				0.144 (0.06)
Cost*Market growth				0.565 (0.23)
Follower*Diff*Market growth				0.280 (0.10)
Follower*Cost*Market growth				5.847** (2.05)
Follower*Technological change				-0.495*** (-5.50)
Diff*Technological change				-0.0124 (-0.17)
Cost*Technological change				-0.0143 (-0.18)
Follower*Diff* Technological change				0.425*** (4.36)
Follower*Cost* Technological change				0.425*** (4.14)
Number of competitors	-0.0211 (-0.77)	-0.0291 (-1.02)	0.0163 (0.53)	0.0120 (0.36)
Merger	0.0282 (0.53)	0.0301 (0.56)	0.0526 (1.00)	0.0923* (1.75)
Part of a group	0.125* (1.70)	0.170** (2.33)	0.177** (2.46)	0.279*** (4.21)
Incumbent	0.0811 (0.84)	0.0859 (0.98)	0.0876 (1.00)	0.104 (1.54)
Country dummies	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes
Quarter dummies	Yes	Yes	Yes	Yes
Constant	0.379* (1.86)	0.260 (1.33)	0.607*** (3.01)	0.344 (1.10)
<i>N</i>	1,025	1,025	1,025	1,025
chi2	136.7	178.3	218.0	484.3
F-test vs. 1	.	23.00***	60.61***	244.26***
F-test vs. 2	.	.	37.06***	211.11***
F-test vs. 3	.	.	.	175.69***

***, **, * Statistically significant at 1%, 5% and 10% levels, respectively.

In particular, to explore the effect of changes in the industry dynamism on firms' profitability, we compute the partial derivate (dy/dx) of *market growth* (Table 3.9) and *technological change* (Table 3.10) to the EBITDA margin of each cohort of entrants with different strategies. For each competitive scenario we calculate the change in y (EBITDA margin) to the change in x (e.g. market growth). For instance, Table 3.9 shows that, for a unit increase in market growth, the performance of followers using cost leadership diminishes by 1.6254 (although the variation is not significantly different from zero), whereas the reduction is of 0.0816 for early entrants with the same strategy. In other words, an increase of 1% in market growth reduces the EBITDA margin of firms using a cost strategy in a 1.62%, in the case of followers, and in 0.08% for early entrants¹¹.

Regarding the effect of market growth, the empirical evidence presented in Table 3.9 shows that increases in market growth negatively affect the profitability of both early and follower firms. However, for early entrants these variations are not significantly different from zero and the conclusion is that early entrants' EBITDA margin is not differently affected by market growth depending on the strategy followed. In line with results from Table 3.6, the competitive strategy followed does not explain differences on early entrants' performance when changes in market growth are considered.

Table 3.9. The effect of market growth on entrants' profitability

	dy/dx	Multiple comparison					
		FC	FD	FS	EC	ED	ES
Follower Cost (FC)	-1.6254	-	***	***	n.s.	n.s.	n.s.
Follower Differentiation (FD)	-7.6131***		-	n.s.	***	***	***
Follower stuck (FS)	-8.0378***			-	***	***	***
Early entrant Cost (EC)	-0.0816				-	n.s.	n.s.
Early entrant Differentiation (ED)	-0.5027					-	n.s.
Early entrant Stuck (ES)	-0.6470						-

***, **, * Statistically significant at 1%, 5% and 10% levels, respectively.

(n.s.) Difference between groups was no significant

¹¹ Note that, as shown in the descriptive analysis, the variable market growth ranges from 0.8% to 19.6%.

In the case of followers, we would expect the effectiveness of the cost strategy to be higher in contexts of higher market growth. As predicted by Hypothesis 2, the evidence presented in Table 3.9 confirms that following a cost leadership strategy is more favorable for followers, since the reduction of their profitability is not significant ($\beta=-1.6254$; $p>0.10$), while they experience a significant decrease in performance if they differentiate ($\beta=-7.6131$; $p<0.01$) or if they get stuck in the middle ($\beta=-8.0378$; $p<0.01$) as market grows. As expected, the comparison between the different categories of followers shows that these differences are significant: using a cost strategy implies a significantly lower variation in EBITDA margin than using differentiation or being stuck in the middle (please see columns 2 and 3 in the first row of the multiple comparison in Table 3.9).

As done in hypotheses H1a and H1b, we also compare the variations in EBITDA margin shown by early entrants vs. followers when market growth increases. It is important to take into account that Table 3.9 reveals that early entrants' profitability is not significantly affected by increases in market growth. The comparative analysis presented in the three first rows and the last three columns of Table 3.9 shows significant differences between early entrants and followers when the later pursue a strategy of differentiation or if they are stuck-in-the-middle. More precisely, the reduction of the performance of followers that differentiate ($\beta=-7.6131$) or get stuck ($\beta=-8.0378$) is greater than the variations shown by early movers when market grows, which are non-significant ($\beta=-0.0816$, $\beta=-0.5027$, and $\beta=-0.6470$ for cost, differentiation and stuck, respectively). However, the variation of the profitability of followers using a cost leadership strategy when market growth increases is not significantly different from the corresponding variations of early entrants, whatever the strategy followed by the later (please, see the last three columns in the first row). Overall, these results support Hypothesis 2 and suggest that cost leadership is the strategy most effective for followers in a context of market growth.

Regarding Hypothesis 3, Table 3.10 reveals that technological change makes little difference on early entrants' profitability whatever the strategy followed. The effect of changes in technology are not significant in any case, as shown in the last three rows of Table 3.10. Conversely, the evidence confirms that followers suffer less from technology changes when pursuing differentiation ($\beta=-0.1086$; $p<0.10$) and cost leadership ($\beta=-0.1114$; $p<0.05$) than when they are stuck in the middle ($\beta=-0.5215$; $p<0.01$). Therefore, the stuck-in-the-middle position is the most harmful strategy, as its performance is reduced almost five times more than with the other two ($\beta=-0.5215$; $p<0.01$).

It is important to note that technological changes do not affect followers differently depending on whether they compete in differentiation ($\beta=-0.1086$) or cost ($\beta=-0.1114$), as can be seen in the second column of the first row in the multiple comparison section. As a result, a differentiation strategy seems to be as effective as a cost strategy for followers in contexts of technological change. Similarly, we find no differences when followers differentiating ($\beta=-0.1086$) or using cost strategies ($\beta=-0.1114$) are compared with early movers ($\beta=-0.0407$, $\beta=-0.0388$, and $\beta=-0.0264$ for cost, differentiation and stuck, respectively), as shown in the last three columns of the first two rows of Table 3.10. Overall, these results do not support Hypothesis 3, as the cost strategy is not confirmed to be less effective than other strategies in context of technological change.

Table 3.10. The effect of technological change on entrants' profitability

	dy/dx	Multiple comparison ^a					
		FC	FD	FS	EC	ED	ES
Follower Cost (FC)	-0.1114**	-	n.s.	***	n.s.	n.s.	n.s.
Follower Differentiation (FD)	-0.1086*		-	***	n.s.	n.s.	n.s.
Follower stuck (FS)	-0.5215***			-	***	***	***
Early entrant Cost (EC)	-0.0407				-	n.s.	n.s.
Early entrant Differentiation (ED)	-0.0388					-	n.s.
Early entrant Stuck (ES)	-0.0264						-

***, **, * Statistically significant at 1%, 5% and 10% levels, respectively.

^a Difference between groups was no significant (n.s.)

3.6. CONCLUSION AND DISCUSSION

Our study advances research on the entry timing literature by exploring the role of competitive strategy and industry dynamism in the traditional relationship order of entry-performance. Firstly, we argue in terms of an optimal fit between the order of entry and the competitive strategy followed by firms to achieve superior advantages. In particular, our study proposes that differentiation like strategies will offer early-movers greater performance levels, whereas cost leadership will be the most profitable strategy for followers. Secondly, we integrate competitive strategies and industry dynamism to study the sustainability of the early-entrant advantages. Specifically, the effectiveness of the followers' cost strategy to erode advantages from entering first is expected to be higher in contexts of greater market growth, whereas cost leadership will be less effective in contexts of higher pace of technological change. The empirical results obtained offer interesting insights that can be summarized in three main conclusions.

First, it seems clear from the empirical evidence that entering first leads firms to obtain superior performance, thus confirming the existence of early mover advantages in the mobile telecommunication industry. More interestingly, our study reveals that the order of entry effect prevails over that of the competitive strategy. Stated differently, the fact of using one or another strategy seems to make little difference on early movers' profitability. In that regard, when early entrants with different strategies are compared, no significant differences in profitability are found in any case. Moreover, on average, early entrants also outperform follower firms regardless of the strategic choice of the latter. Therefore, the empirical evidence shows that early movers are always better than latecomers in all the competitive scenarios considered.

Second, our findings confirm that the competitive strategy chosen does matter for follower firms. The relevance of considering the way latecomers compete seems to be

essential to explain performance differences among them. In particular, cost leadership is confirmed to be the most suitable strategy to reduce the performance advantages of entering early.

Finally, the pace of industry dynamism has been shown to play a significant role when examining the effectiveness of the competitive strategies used by followers in eroding advantages from entering first. Whereas growing markets are more suitable for cost leaders to defeat early entrants' advantages, the use of a cost strategy seems to be as good as differentiation in contexts of high technological change.

Overall, these conclusions have both theoretical and managerial implications.

From a theoretical point of view, the contribution of this study is threefold. First, our paper seeks to advance existing knowledge on relationship between order of entry and performance and to contribute to the current debate on the sustainability of early-movers advantages (Greve and Seidel, 2014; Tellis, 2014; Zachary et al., 2015). In particular, we clarify prior conflicting evidence by exploring how competitive strategies influence the way early entrants compete and create value. Our research evidences that the importance of being early prevails over the way first-movers compete, supporting those studies that advocate for the benefits of being first (Greve and Seidel, 2014).

Second, our study contributes to the emerging line of research that investigates the way in which follower firms are able to successfully penetrate the market and enjoy advantages over its rivals (Fosfuri et al., 2013; Shamsie et al., 2004). The empirical evidence presented in this chapter suggests that the sustainability of early mover advantages may be threatened, to a greater extent, if followers use the strategy that is presumed to offer a better fit with the prevailing market demands they face when entering the market (as the reading of Rogers, 1995, would suggest). More precisely, cost leadership is confirmed to be more

appropriate to reduce the performance gap between early and late movers, at least in markets following a typical development pattern.

This brings us to the third contribution of our research. Our analysis incorporates industry dynamics to study the effectiveness of followers' strategies to compete in different marketplaces and gain profitability. Whereas a cost leadership position seems to be more effective in reducing performance advantages of entering first when a rapid-pace market growth occurs, differentiation like strategies seems to be as useful as cost strategies in contexts characterized by a higher pace of technology evolution. Hence, our findings reveal the need of considering the influence exerted by both micro and macro aspects in those studies aimed at explaining performance differences among different cohort of entrants. These results contribute to advancing research on the most suitable competitive orientation for successful follower firms (De Castro and Chrisman, 1995; Durand and Coeurderoy, 2001; Shamsie et al., 2004), while complementing current understanding on the effect of industry dynamics on early mover advantages (Suárez and Lanzolla, 2007).

Regarding managerial practices, our study has several implications for market entry decisions. First of all, managers must take into account the relevance of entering first as it has been broadly confirmed to confer firms substantial performance advantages over its rivals. In the case of follower firms, however, the critical implication of this study is that the competitive disadvantages of entering later could be reduced with a right decision of how to compete. Moreover, managers should also look carefully at the pace of evolution of the industry, as it might influence their chances of success. Despite our study has confirmed the detrimental effect of market growth and technological change for followers' advantages, it has also revealed key insights about the competitive positions they should pursue to reduce the performance gap with early movers. Greater levels of market growth will be less harmful for follower firms that enter with a cost strategy. However, differentiation has been confirmed to

be as good as cost leadership when there is a high degree of technological change. Therefore, it is important to stress the need of paying equal attention to both micro- and macro-level aspects when thinking about how to compete in dynamic markets.

Despite these contributions, several issues could be considered in future studies. First, the empirical analysis carried out in this research focuses on the telecommunication industry, which has been characterized by a high level of dynamism since the emergence of the mobile services. It might be convenient, therefore, to replicate the empirical analyses across different research settings in order to know whether scholars obtain similar results, thus allowing the generalization of current findings. Second, our study is based on prior entry-timing research (Suárez and Lanzolla, 2007) that conceptualizes industry dynamism in terms of market growth and technology evolution. However, it would also be interesting to delve into the understanding of other environmental level factors that may condition firms' competitive behavior and performance. Further studies could analyze, for instance, the way in which the degree of development of formal and informal institutions (North, 1990) enables or disables the isolating mechanisms from which first movers benefit (Fosfuri et al., 2013), which might affect the opportunities early entrants have to take advantage from the competitive strategy implemented.

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Chapter 4.

ENTRY MODE AND INNOVATION ADOPTION OF MULTINATIONAL FIRMS.

The effect of cultural distance and home/host
country development

4.1. INTRODUCTION

The remarkable worldwide growth of foreign direct investment during the last decades has led to a considerable body of research that examines what factors influence multinational enterprises (MNEs) entry mode decisions when going abroad (Barkema, Bell, and Pennings, 1996; Brouthers and Hennart, 2007; Mutinelli and Piscitello, 1998). In particular, the differences in national cultures between the MNE home country and the subsidiaries host markets have gained attention (Brouthers and Brouthers, 2001; Kogut and Singh, 1988; Tihanyi, Griffith and Russel, 2005). Despite the literature seems to be “unanimous in recognizing that the higher the sociocultural distance between home and host countries, the lower the degree of control demanded by foreign investors” (Mutinelli and Piscitello, 1998: 499), the empirical evidence remains inconclusive (see Beugelsdijk, Kostova, Kunst, Spadafora and van Essen, 2018; Tihanyi et al., 2005). As a result, researchers claim for further research to fully understand the role of cultural distance in determining firms’ entry mode decisions. Factors such as the type of industry or the country of origin of the MNEs (Beugelsdijk et al., 2018; Liou, Chao and Yang, 2016; Tihanyi, et al., 2005; Zhao, Luo and Suh, 2004) have been suggested as worth of being taken into account.

Moreover, as most studies have examined factors influencing MNEs entry decisions (Meyer and Estrin, 2001; Mutinelli and Piscitello, 1998), there is a lack of research on analyzing post-entry competitive behaviors. To delve into the understanding of how MNEs’ subsidiaries create value and grow in foreign markets (Canabal and White, 2008; Chang, Gong and Peng, 2012) is worthwhile if we want to advance research on international business. In that regard, Meyer and Peng (2016) point out that the understanding of headquarter-subsidiary relationships in the different markets where they operate could be one of the most prominent areas of research.

This study seeks to offer a more fine-grained analysis of the factors that may affect MNEs strategic decision-making when engaging in cross-border business activities. Firstly, we assess the role of the degree of development of the country of origin of MNEs in the relationship between cultural distance and entry mode choice¹. By doing so, we address current demands for a detailed understanding of “new MNEs” from emerging and developing economies (EMNEs, hereafter) that are claimed to behave differently from multinational enterprises from developed economies (DMNEs, hereafter) (Cuervo-Cazurra, 2012; Guillén and García-Canal, 2009; Hoskisson, Wright, Filatotchev and Peng, 2013; Ramamurti, 2012). Then, we reflect on how the entry mode choice shapes subsidiaries strategic decisions by analyzing its influence on the adoption speed of innovations. Finally, our study considers how contextual conditions may influence the way subsidiaries behave. We explicitly control for the moderating effect of the development of the host country where subsidiaries compete, as it could influence the costs and risks perceived by firms and, therefore, the proposed relationship between the degree of control exerted by the MNE and the adoption speed of innovations.

Overall, the contribution of this study is twofold. First, we shed light on the conflicting evidence regarding the effect of cultural distance on the entry mode (see, Tihanyi et al., 2005). In that regard, our study aims to refine prior theoretical arguments (Cuervo-Cazurra, 2012) by emphasizing the need to consider additional factors, formerly overlooked, but essential in a worldwide research. In particular, the development of the MNEs country of origin is brought to the foreground in order to analyze the extent to which it can explain

¹ Following the review performed by Brouthers and Hennart (2007), two main classifications of MNEs modes of entry can be distinguished in the international entry mode literature: the entry mode choice and the establishment mode choice. Whereas the entry mode choice mainly considers ownership differences between shared and fully owned subsidiaries, the establishment mode refers to the decision of entering a foreign market via greenfields or acquisitions. In this study we focus on the former and, from now on, we refer to the entry mode decision as the degree of control exerted by the MNE over the subsidiary (Anderson and Gatignon, 1986; Brouthers, 2002; Erramilli and Rao, 1993; Gatignon and Anderson, 1988; Mutinelly and Piscitello, 1998). Those firms choosing full ownership entry modes “want maximum control and are willing to make maximum commitment and take on maximum risk” (Brouthers and Hennart, 2007: 396).

differences in their internationalization behavior (Beugelsdijk et al., 2018; Guillén and García-Canal, 2009).

Second, we contribute to the international management literature by examining how MNEs behave once they have entered a target market (Canabal and White, 2008; Meyer and Peng, 2016; Zhou and Li, 2008). Specifically, we expand current knowledge on MNE-subsidary relationship as we test whether the control exerted by MNEs over subsidiaries influences its innovation behavior. Our contention is that MNEs operating with a shared-owned subsidiary may show a lower adoption speed of innovations than fully-owned ventures because of superior costs and risks incurred when conducting innovation with partners. The empirical evidence supports our hypothesis as shared-owned ventures take longer to adopt innovations in comparison with fully-owned subsidiaries. Contrary to our expectations, we do not find a significant influence exerted by the degree of development of the host country.

We test our hypotheses within the worldwide mobile telecommunication industry by using a panel data for the period 2000–2017. The data used mainly comes from the Wireless Intelligence Database (2017) and refers to the internationalization process of 18 multinational groups that entered in 91 countries. The wide scope of the research setting allows us to examine how MNEs compete in the five continents over the past two decades.

The rest of the paper is structured as follows. The next section develops the theoretical framework. Then, the three hypotheses proposed are presented in Section 3. The database, the description of the variables and the methodology used to test the hypotheses are shown in Section 4. The main results of the empirical analysis are presented in Section 5. Finally, we close the paper by discussing our main findings and proposing further lines of research.

4.2. LITERATURE REVIEW ON MNEs ENTRY MODE

Delving into the understanding of factors influencing the MNE internationalization process has been a key concern in the international business (IB) literature. In particular, scholars have shown a particular interest in the concept of “distance” between countries and the way it may influence managers’ decisions and outcomes of MNEs when expanding abroad (see, for instance, López-Duarte and Vidal-Suárez, 2013). Distance is considered a major impediment in MNEs expansion as it has been confirmed to affect location choices, entry mode and performance, among others (Johanson and Vahlne, 1977; Kogut and Singh, 1988; Tihanyi et al, 2005). The greater the distance, the higher the difficulties to collect, analyze and interpret information about the foreign country and, consequently, to do business abroad (Håkanson and Ambos, 2010). Due to its importance in the process of MNEs internationalization, studies from different domains have analyzed the effect of distance from diverse points of view including linguistic distance (Demirbag, Glaister and Tatoglu, 2007), economic distance (Tsang and Yip, 2007) or geographic distance (Eden and Miller, 2004), among others. However, as recently stated by Beugelsdijk et al. (2018: 90) “despite such proliferation, cultural distance, that is, the difference in cultural values between two countries, remains the most widely used type of distance in international business”. Given its relevance in the IB literature for decades (see, for instance, Anderson and Gatignon, 1986; Brouthers and Brouthers, 2001; Hutzschenreuter, Voll, and Verbeke, 2011; Kogut and Singh, 1988; Tihanyi et al., 2005), the way cultural distance affects firms internationalization decisions has been addressed from different theoretical perspectives.

According to the stages model of internationalization (Johanson and Vahlne, 1977), firms are assumed to firstly expand to those countries that present similar characteristics to the home country. Following an incremental internationalization process, managers would prefer to expand to more similar countries, in terms of physic distance, as similar linguistic

and cultural codes are shared. Lower differences between foreign and home countries would reduce the cost entry by facilitating the flow of information and coordination.

Likewise, the idea that firms prefer to enter cultural distant markets by sharing control and risks with others -due to cost and uncertainty constraints- has been widely recognized. Using a transaction cost perspective, scholars have pointed out the cultural distance between the firm's home and the host country as a source of uncertainty (Anderson and Gatignon, 1986; Erramilli and Rao, 1993; Gatignon and Anderson, 1988). The greater the cultural distance, the lower the degree of control a firm "should and does demand" (Gatignon and Anderson, 1988: 311). These authors reflect on the idea that the uncertainty that managers perceived in more distant markets makes them more willing to transfer risk to others by sharing ownership. Root (1983) states that sociocultural differences commonly lead to higher information-acquisition costs, which firms may avoid by turning management over other partners. More specifically, firms might prefer to cooperate with local partners to reduce knowledge barriers, speed the organization learning and diminish the risk exposure associated with entries into less similar cultural markets (Brouthers and Brouthers, 2001). Thus, MNEs entering more culturally distant markets would show higher preference for entering via shared-owned over fully controlled subsidiaries.

Despite this idea has been broadly supported by the empirical evidence (Demirbag et al, 2007; Liou et al., 2016; Mutinelli and Piscitello, 1998), some studies have shown opposite results, as firms in more culturally distant countries are found to choose higher equity modes of entry as well (e.g. Erramilli, Agarwal and Kim, 1997; Padmanabhan and Cho, 1996). Higher equity modes might facilitate MNEs to better control their international operations and diminish information costs when transferring competences to more distant markets. Accordingly, MNEs may be expected to react to large cultural differences by demanding rather than avoiding ownership in order to reduce the transaction costs associated with more

dispersed modes of entry (see, Brouthers and Brouthers, 2001; Tihanyi et al., 2005, for a review).

In an attempt to reconcile conflicting evidence, several studies have recently emphasized the need of considering additional factors, such as the country of origin of MNEs or the development of investment target markets, as they may enrich current insights on MNEs entry mode decisions (Beugelsdijk et al., 2018; Cuervo-Cazurra, 2012; Tihanyi et al., 2005). In particular, the study of how the country of origin of MNEs influences its internationalization process has become a key area of debate in the IB literature (Cuervo-Cazurra, 2012; Guillén and García-Canal, 2009; Khanna and Papelu, 2010; Peng, 2012; Ramamurti, 2012). As claimed by Cuervo-Cazurra (2012: 163), “most studies in the international business literature focus on analyzing how the conditions of the host country affect inward foreign investment”. Nevertheless, the way the conditions of the country of origin shape firms’ outward foreign investments has received limited attention.

It is important to note that scholars have traditionally associated the concept of MNEs to the possession of overwhelming domestic assets, which are exploited abroad and confer multinationals superior advantages (Mathews, 2006). Proprietary technologies, brands or managerial capabilities are commonly linked to DMNEs-specific assets. Early studies focused on the phenomenon of “new” MNEs from emerging, developing, or lower-middle-income countries have pointed out the existence of *different* advantages –as a reflection of distinctive conditions of their home country–, that may shape their internationalization decisions (Guillén and García-Canal, 2009; Ramamurti, 2012). Whereas marketing or technological capabilities are emphasized for DMNEs, political and networking skills in more turbulent environments (among other non-conventional ones) may be crucial in EMNEs internationalization. Contrarily, the lack of strategic resources is seen as an important obstacle in their expansion abroad.

Besides, IB studies underline how, in an attempt to “close the gap between their market reach and the global presence of the MNEs from developed countries”, EMNEs have shown an extraordinarily accelerated pace of internationalization in the last decades (Guillén and García-Canal, 2009: 27). As most MNEs have already achieved a high degree of internationalization, subsidiaries’ strategic behavior seems to inevitably draw researchers’ attention as a key concern for MNEs competitiveness and growth in each market (Meyer and Peng, 2016). In that regard, scholars highlight the study of “how a firm’s entry mode choice will influence post-entry decisions and performance” (Canabal and White, 2008: 277) as a fruitful avenue of research. As a response to this void, several studies have shown its interest in the innovation carried out by MNEs foreign affiliates when competing abroad (Belderbos, 2003; Zhang, Li, Hitt and Cui, 2007; Zhou and Li, 2008), given its influence on firm growth (García-Manjón and Romero-Merino, 2012).

On this point, it seems sensible to underline the lack of research analyzing the influence exerted by MNEs entry mode on subsidiaries’ innovation. Furthermore, the existing work on this issue has focused, for the most part, on examining innovation carried out by subsidiaries operating in emerging countries with a specific type of entry mode: international joint ventures (e.g., Zhang et al., 2007; Zhou and Li, 2008). Scholars on this line of research state that the ownership structure shown by the international joint venture (i.e. the proportion of ownership controlled by foreign and local partners) exerts an imprinting impact on its innovation behavior. Two main arguments are used. On the one hand, studies that suggest the need of a balanced ownership structure. Conducting innovation activities will require, not only advanced foreign technology, but also local partners’ thorough understanding of market opportunities and domestic needs (e.g., Zhou and Li, 2008). On the other, scholars that defend greater ownership levels as a mechanism to protect foreign MNEs proprietary knowledge, while mitigating local partners’ opportunism (see Zhang et al., 2007).

In any case, the few studies on this issue focus specifically on firms operating through a particular type of entry mode, which offers evidence on MNEs innovation behavior from a very specific point of view. Our study progresses in the international business literature by analyzing how the MNEs entry mode (i.e. shared owned vs. fully owned subsidiaries) affects their innovation behavior when competing abroad. Moreover, the existing evidence is generally focused on analyzing subsidiaries innovation in a specific country, such as international joint ventures in China (Zhang et al., 2007; Zhou and Li, 2008). However, it seems reasonable to suspect that the conditions of the context in which subsidiaries operate might influence their innovation behavior (Chang, Chung and Mahmood, 2006). Accordingly, our study proposes that the development of the host market could affect the incentives that subsidiaries have to invest in innovation, thus moderating the entry mode-innovation relationship.

Overall, the aim of this research is twofold. First, we deep the analysis on how the relationship between the cultural distance between countries and MNEs entry mode decisions is moderated by the conditions of the country of origin². Then, we argue that, once MNEs have entered the market, the way subsidiaries behave will be conditioned by both their entry mode and the degree of development of the host country in which firms operate.

4.3. HYPOTHESES

4.3.1. Cultural distance and entry mode: The country-of-origin effect

Despite the positive influence of sociocultural distance on the propensity of firms to enter in a new market exerting a lower control is an argument commonly accepted in international business studies (Erramilli and Rao, 1993; Gatignon and Anderson, 1988;

² There are multiple terms used to refer to those non-advanced economies in prior literature (e.g. underdeveloped, developing, Third World, among others). In our study, we differentiate between *developed* and *developing and emerging* economies according to the International Monetary Fund classification. Despite the heterogeneity across countries included in each group, we use this broad classification to facilitate the discussion.

Mutinelly and Piscello, 1988), the empirical evidence is still conflicting on this matter. To clarify this question, recent theoretical studies point out the need to examine other factors, such as MNEs origin, as it might directly affect their competitive behavior and, specifically, their internationalization decisions (see, for instance, Beugelsdijk et al., 2018). In that regard, specific contingencies of their home countries would lead managers to act differently in cross-border transactions. Hence, our contention is that differences in the country of origin of MNEs will moderate the positive effect of cultural distance on the preference for choosing a shared-ownership entry mode (vs a fully owned subsidiary). Two opposing arguments can be found on this issue in the IB literature.

Some studies suggest that the uncertainty involved in greater distant markets may be compensated by managers' superior tolerance levels for competing in low trustworthy contexts (Cuervo-Cazurra, 2012). In that regard, managers of EMNEs would be characterized by presenting lower levels of risk aversion because of the higher levels of uncertainty, instability and crises prevalent in their home country. This ability to adequately operate in more difficult business environments has been suggested as a *different* ownership advantage possessed by MNEs from emerging and developing economies (Ramamurti, 2012; Guillén and García-Canal, 2009). This capability to better deal with risk might alleviate the negative impact of cultural distance on higher-equity entry modes of EMNEs subsidiaries.

However, it would be also noteworthy to recognize the existence of other contextual conditions that will influence the way MNEs behave. Specific characteristics of the country of origin when referring to EMNEs lead scholars to consider possible restrictions that might affect their ownership strategies in the opposite direction. Due to financial and managerial resource constrains, MNEs from emerging and developing countries might prefer low commitment entry modes (such as shared ownership) to retain maximum financial flexibility while compensating the cost of entering in markets with greater cultural differences (Chung

and Dahms, 2018). In line with this idea of considering the influence of emerging markets conditions, Erramilli, Agarwal and Kim (1997: 736) point out that “ownership advantages may be shaped by the characteristics of the home country”. In that regard, prior absolute advantages found for many DMNEs would be explained because of their home-country resource endowments (Porter, 1990). For instance, regarding socioeconomic factors, developing economies are typically characterized by presenting lower education levels, less developed infrastructures (Fisman and Khanna, 2004), worse capital markets (Khanna and Palepu, 1997), less sophisticated innovation systems (Fagerberg and Srholec, 2008) and fewer and less developed suppliers, in comparison with developed countries (see Cuervo-Cazurra, 2012). The latter, in general, do not suffer from these drawbacks. As argued by Guillén and García-Canal (2009), DMNEs enjoy stronger competitive advantages since they will have superior access to vital strategic resources available in-house.

In that regard, although MNEs are expected to choose shared-ownership modes in culturally distant markets to minimize risks and potential costs, DMNEs might find necessary to exert greater control over their subsidiaries in order to protect their sources of competitiveness and the transferability of key competences in far-flung locations (Guillén and García-Canal, 2009). In those cases, the benefits of increased control to protect their strategic assets could offset the costs of resource commitment and the risk of entering in high cultural distant markets. Conversely, EMNEs facing greater cultural distance will be more likely to collaborate in order to complement their lack of resource endowments and knowledge competing abroad (Demirbag, Tatoglu and Glaister, 2009).

Hence, we would expect DMNEs to compete with greater commitment entry modes than EMNEs in more cultural distant markets. Accordingly, our first hypothesis states that:

Hypothesis 1: *The positive effect of cultural distance on the probability of choosing a shared ownership entry mode (vs. a full ownership entry mode) will be lower for MNEs from developed countries than for MNEs from developing or emerging countries.*

4.3.2. Entry mode choice and subsidiaries' innovation

It might be important to note that, by 2018, most MNEs have entered in a broad range of developed and developing economies and their concern of how to enter may have been replaced by how to compete (Meyer and Peng, 2016). Once entry barriers are overcome, MNEs efforts must be focused on coordinating and adequately exploiting resources and skills in different marketplaces where they operate. Hence, current MNEs' challenge is to manage the way their subsidiaries compete overseas to ensure sustainable growth and profitability (Canabal and White, 2008).

In highly competitive and dynamic contexts, innovation is suggested as an engine driving firm growth (Coad and Rao, 2008; García-Manjón and Romero-Merino, 2012). Accordingly, a considerable body of research has been focused on examining those factors that influence firms' innovation. Traditionally, market structure was suggested as a key determinant of firms' innovation behavior (Schumpeter, 1934, 1942). Nevertheless, even those studies based on an individual sector were unable to explain why firms, facing similar external conditions, showed such variability regarding their innovation performance (see Belloc, 2011; Fagerberg et al., 2005). Due to this lack of consensus, scholars began to look inside the firm and, specifically, to look at its system of corporate governance. As firms differ in their internal governments' structures (Coase, 1937), scholars suggest that such differences will inevitably influence decision making-processes and, consequently, firms' innovation performance. Surprisingly, "this field of research has not benefited so far from a systematic discussion" (Belloc, 2011: 3).

Delving into this line of work, empirical studies examining the link “corporate governance-firm innovation” have suggested the corporate ownership concentration as a key factor influencing firms’ decisions (Choi et al., 2011; Choi et al., 2012). Though different approaches have been used to address the relationship (see Belloc, 2011, for a review), transaction cost theory (TCT) has been commonly employed when firms decisions involve high levels of uncertainty and intangible assets (see, for instance, Chang, Chung and Moon, 2013; Robertson and Gatignon, 1998). According to TCT (Williamson, 1975; 1985), firms make decisions between markets or hierarchies depending on certain factors that may affect transaction costs between parties such as asset specificity, uncertainty, information asymmetry and opportunism, among others. Consistent with the premises of the TCT, we contend that entry modes (shared-owned vs. fully owned subsidiaries) will influence the costs and risks assumed by partners when making innovation investments. Specifically, we propose that the mode of entry will affect the adoption speed of innovation shown by subsidiary firms.

First, investments in assets presenting high levels of specificity (such as, for instance, expenditures in innovation projects) might increase the risks of partners’ opportunism. As a result, firms would incur in higher costs of preventing potential self-interest (*ex ante*) as well as renegotiating costs (*ex post*), as the collaborative relationship goes by (Williamson, 1985). Hence, in presence of asset specificity, partners’ opportunistic behavior can make the shared-owned firms option more costly (Chang et al., 2013).

Second, the existence of asymmetric information and of different interests between partners might slow down the innovation process. In presence of hidden agendas and parties’ self-interest to maximize their utility (Das and Teng, 1998), the negotiation process to establish a common goal, and more specifically, to pursue a project whose final result is surrounded by a high degree of uncertainty could be complex and time-consuming. By considering equity ownership as a proxy for partners’ control over subsidiaries innovation

investment decisions (Zhang et al., 2007), we would expect shared-owned firms to show a slower innovation process than fully owned subsidiaries.

Finally, it has been also suggested that fully owned subsidiaries could make decisions faster since they do not have to incur in negotiation cost with partners (Chang et al., 2013). Reflecting on the external uncertainty of the economic context where firms compete, superior levels of control over the management and decision system facilitate an easier and quicker adaptability to environmental changes (Robertson and Gatignon, 1998). Shared-owned firms might be less effective decision-makers as external uncertainty increases and, therefore, it seems reasonable to consider that a higher decision control will favor a quicker adoption and implementation of innovations.

For all these reasons, in our second hypothesis we postulate that:

Hypothesis 2: Shared-owned subsidiaries will show lower adoption speed of innovations than fully-owned subsidiaries.

4.3.3. The moderating effect of host country development on subsidiaries' innovation

One important thing to consider at this point is that the economic context in which firms compete may also influence the way they behave (Shinkle and Mccann, 2014). In particular, we consider that the degree of development of the host market may affect the costs and risks firms assume when performing their innovation strategy, while diminishing potential opportunism.

As aforementioned, developed economies present certain characteristics significantly different from those of developing countries. Regarding socioeconomic and regulatory factors, less developed countries generally present poorer infrastructure, worse regulative regimens, unpredictable government policies, less transparency, fewer rights and lower freedom levels (Cuervo-Cazurra, 2012). These are basic national dimensions to secure a well-

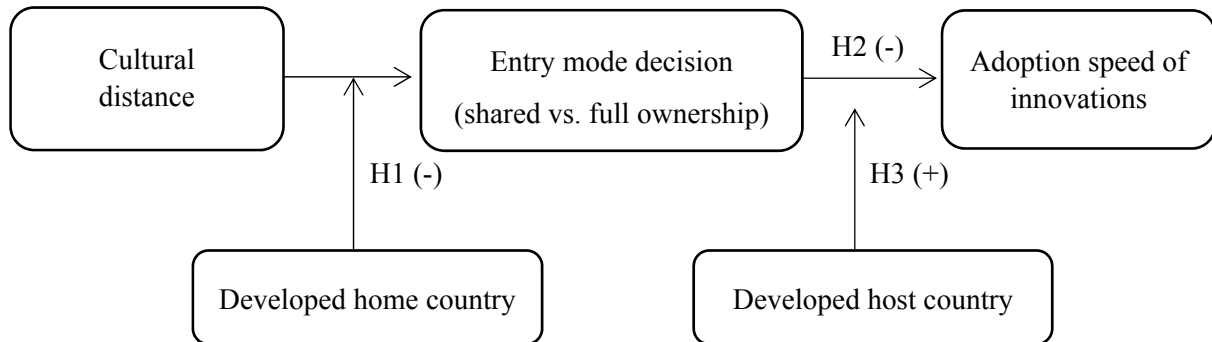
functioning of the economic framework in any country. Most of these factors have been confirmed to play an essential role in explaining cross-country innovation differences (Furman, Porter and Stern, 2002; Varsakelis, 2006). For instance, an effective enforcement of property rights protection will positively influence firms' innovation, as it would reduce the likelihood of suffering from private property expropriation.

Taking into account the impact exerted by the economic context on firm behavior, we suggest that the degree of development of the host country will affect the costs and risks perceived by subsidiaries when investing in innovation. In particular, our contention is that the degree of development will affect shared-owned subsidiaries to a greater extent, as their investments would be subject to the other parties' opportunism. On the one hand, less developed environments may increase the risks and costs that firms assume when they are involved in a shared-owned subsidiary. Emerging economies are generally characterized by presenting market failures (Hoskisson, Eden, Lau, Wright, 2000). This implies that transactions between parties will be subject to higher contractual hazards because of the weaker regulatory and legal regimes that generally characterize those contexts. In those contexts, the possibility of a partner acting opportunistically along the innovation process might cause renegotiating costs to increase and the process of adoption and implementation of innovations to slow down. Conversely, more developed contexts will reduce the threat of opportunism and, therefore, will protect shared-ownership firms when pursuing innovation investments with partners. In our framework, this involves that the negative influence of competing through a shared-ownership subsidiary on the adoption speed of innovation will be weaker, the greater the development of the environment is. Therefore, we state our third hypothesis as follows:

Hypothesis 3: The degree of economic development of the host country will positively moderate the negative effect of shared-owned subsidiaries on the innovation adoption speed.

Accordingly, we develop a two-stage model that is graphically presented in Figure 4.1.

Figure 4.1. Model of analysis



4.4. EMPIRICAL ANALYSIS

4.4.1. Data and sample

4.4.1.1. Research setting: The mobile communications industry

We test our hypotheses in the mobile telecommunication industry. The information about international group entries and subsidiaries behavior mainly comes from the GSMA Intelligence Database (2017). To evaluate the influence of nation-level factors, we collect data from The World Bank indicators and the cultural dimensions of the Hofstede index. We use the country classification of the International Monetary Fund (IMF) to differentiate between developed and developing economies.

Our data set includes quarterly information of 18 international groups and 260 subsidiaries for the period 2000-2017. A detailed list of the multinational groups considered is shown in Table 4.1. It might be noteworthy to mention that we are using information from MNEs operating in the five continents³. Hence, we consider that our research setting is

³ In particular, the multinational groups included in this study compete in the following countries: Albania, Angola, Argentina, Australia, Austria, Bangladesh, Belgium, Brazil, Bulgaria, Burkina Faso, Cabo Verde, Canada, Chile, Colombia, Costa Rica, Croatia, Czech Republic, Denmark, Dominican Republic, Ecuador, Egypt, El Salvador, Estonia, Fiji, Finland, France, Germany, Ghana, Greece, Guatemala, Honduras, Hong Kong, Hungary, India, Indonesia, Iran, Iraq, Ireland, Israel, Italy, Jamaica, Jordan, Kenya, Kuwait, Latvia, Lebanon, Lithuania, Luxembourg, Malawi, Malaysia, Malta, Mexico, Morocco, Mozambique, Namibia, Nepal, Netherlands, New Zealand, Nigeria, Norway, Pakistan, Panama, Peru, Philippines, Poland, Portugal, Puerto Rico, Romania, Russian Federation, Saudi Arabia, Senegal, Serbia, Sierra Leone, Singapore, Slovakia,

adequate to test our hypotheses as it offers considerable variability of cultural and economic environments.

Table 4.1. Description of MNEs in the sample

Multinational enterprise	Home Country	Group origin^a
1. AT&T Group	United States of America	Developed
2. America Movil Group	Mexico	Developing
3. Axiata Group	Malaysia	Developing
4. CK Hutchison Group	Hong Kong	Developed
5. Deutsche Telekom Group	Germany	Developed
6. Etisalat Group	United Arab Emirates	Developing
7. KPN Group	The Netherlands	Developed
8. Oi Group	Brazil	Developing
9. Orange Group	France	Developed
10. Orascom Telecom	Egypt	Developing
11. STC Group	Saudi Arabia	Developing
12. Singtel Group	Singapore	Developed
13. Telecom Italia Group	Italy	Developed
14. Telefonica Group	Spain	Developed
15. Telenor Group	Norway	Developed
16. Telia Sonera Group	Finland	Developed
17. Turkcell Group	Turkey	Developing
18. Vodafone Group	United Kingdom	Developed

^aAccording to the International Monetary Fund classification.

4.4.1.2. Variable description

Dependent variables

As shown in Figure 4.1, we build a two-stage model to test our hypotheses. Accordingly, two dependent variables are included in this study. First, in testing the effect of cultural distance and MNEs home country development on the entry mode decision, we defined the variable *shared ownership*. Second, to assess whether the entry mode decision

Slovenia, South Africa, Spain, Sri Lanka, Sweden, Switzerland, Thailand, Turkey, Ukraine, United Arab Emirates, United Kingdom, United States of America, Uruguay, Venezuela, Vietnam, Zambia.

and the development of the host country shape subsidiaries innovation behavior, we used the *adoption speed of innovations* as the dependent variable. Each of these variables is described in more detailed below.

Shared ownership

Our definition of firms' entry mode is based on percentages of ownership equity controlled by MNEs. In line with the majority of empirical studies, we use a stake of 10% in a foreign company as a minimum to be considered as a foreign direct investment (Benito and Gripsrud, 1992; Dikova and van Witteloostuijn, 2007; López-Duarte and Vidal-Suárez, 2013; Liou et al., 2016; Mutinelly and Piscitello, 1998)⁴. In particular, we identify the control exerted by the MNE over the subsidiary by defining a dummy variable, *shared ownership*, which equals 1 whether the MNE owns at least 10% and less than 95% of the foreign subsidiary equity. *Shared ownership* takes the value 0 when the equity owned by the MNE is 95% or more (Mutinelly and Piscitello, 1998).

Adoption speed of innovations

In the telecommunication sector, the emergence of a new industry took place with the shift from fixed to wireless technology. As previously noted in Chapter 3, this technological disruption resulted in the appearance of the mobile telecommunication industry in the last decades of the 20th century, which experienced its real takeoff with the irruption of the digital technologies (second generation or 2G). After that, a succession of technological generations (i.e. the third generation (3G), the fourth generation (4G) and the upcoming fifth generation (5G) of mobile communication systems) has marked the evolution of the industry.

⁴ The Organization for Economic Cooperation and Development (OECD) or the International Monetary Fund (IMF) also qualify as investors that make foreign direct investments to those that own at least 10% of a subsidiary equity to exercise management control rights.

These are exogenous technological innovations that telecommunication operators adopt to improve the quality and functionalities of the service offered to the final user.

To define our variable *adoption of speed innovation*, we considered as technological innovations the launch of the 3G and 4G by a firm in any market. As the 2G introduction mostly took place during the early 90s, it was almost fully diffused in all markets at the beginning of our observation window. Therefore, we decided to limit the second part of our empirical analysis to the period 2003-2017, since it covers the period from the first year a firm adopts 3G in our sample and the last one with information available.

Consistent with the extant innovation literature, the variable *adoption speed of innovations* is measured as the mean value of the difference between the period a firm adopts a technological innovation and the last period of adoption of that innovation by any firm in our sample plus one (Damanpour and Gopalakrishnan, 2001; Subramanian and Nilakanta, 1996). We measure this variable on a quarterly basis.

By way of clarification, it might be worth presenting an example to explain how the variable *adoption speed of innovations* is defined. For instance, in the case of the Third Generation (3G) in the mobile telecommunication sector, if firm A introduced the 3G in the first quarter of 2005 (equivalent to the 9th quarter from 2003) and the last adopter launched it by the end of 2011 (equivalent to the 36th quarter), then the adoption speed of firm A is calculated by subtracting 9 from 37 (36+1). Therefore, the *adoption speed of innovations* index is specified as follows:

$$\Sigma ((Y_i + 1) - X_i)/N$$

where Y_i stands for the last period of adoption of technological innovation i by any firm in the sample, X_i is the period of adoption of technological innovation i by firm A, and N refers to the number of technological innovations adopted by firm A.

According to this measure, early adopters would present higher values than late adopters of each technological innovation, showing the last adopter a score of 1. Besides, those firms that did not adopt an innovation were given a score of 0. So, they are considered as very late adopters, showing a score even lower than the actual last adopter (see Subramanian and Nilakanta, 1996).

Independent variables

Cultural distance

Our *cultural distance* variable is measured through the Kogut and Singh's (1988) index, widely used in studies of foreign entries (e.g. Barkema et al., 1996, 1997; Erramilli and Rao, 1993; Hutzschenreuter et al., 2011; Liou et al., 2016; Mutinelly and Piscitelly, 1998). This index is an aggregate of four scores of the Hofstede (1980) national dimensions (power distance, individualism, masculinity and uncertainty avoidance) and it is calculated as differences in scores between pairs of countries.

MNEs origin

To know whether the degree of development of the MNE home country shapes multinationals entry mode decisions, we define the dummy variable *developed home country*. According to the classification of the IMF, the variable *developed home country* takes the value 1 if the country of origin of the MNE belongs to the group of economies classified as developed, and 0 in the case of countries considered as emerging or developing economies (see Table 4.1). Besides examining whether the *developed home country* moderates the relationship between cultural distance and entry mode in the first-stage of our model, we maintain it as a control variable in the second stage.

MNEs host country

To test whether the degree of development of the host country affects subsidiaries innovation strategies, we defined the dummy variable *developed host country*. As with *developed home country*, we have used the IMF classification to differentiate the degree of development of host markets. Accordingly, the *developed host country* equals 1 if the subsidiary competes in a developed economy, and 0 otherwise. Since the type of country in which MNEs invest may influence their entry decisions (Tihanyi et al., 2005), we decided to use the *developed host country* as a control variable in the first stage of our model.

Control variables

Apart from those described above, we include several control variables that might affect MNEs entry decisions and subsidiaries innovation strategies. To control for the size of the MNEs, we incorporate the variable *group size* that counts the number of subsidiaries a MNEs has in each period. Greater internationalization experience of large multinationals is expected to diminish the uncertainty of MNEs when expanding abroad, thus reducing the negative impact of cultural distance on higher-control entry modes. Moreover, our model control for the presence of the MNE in host markets which are geographically close⁵ to the ones of each subsidiary by including the variable *regional intensity*. We express this variable as the percentage of subsidiaries within a geographic area over the total MNEs' subsidiaries⁶. In that regard, this variable accounts for any possible effects due to MNEs' regional strategic emphasis. Besides, we include a set of *international group* variables to control for other

⁵ We define geographic areas according to the United Nations classification. Available at: <https://unstats.un.org/unsd/methodology/m49/>

⁶ For instance, the CK Hutchison Group was present in twelve countries in the last quarter of 2009. In particular, the group offered telecommunication services in Australia, Austria, Denmark, Hong Kong, Indonesia, Ireland, Italy, Sri Lanka, Sweden, Thailand, United Kingdom and Vietnam. To build our variable of regional intensity, we take into account the presence that the group has in different geographical areas. So, at that moment, there were six of the twelve subsidiaries, which were located in the European market, whereas five were in the Asian market and just one was in Oceania. Therefore, the variable regional intensity takes the value 0.50 in the case of operators located in Austria, Denmark, Ireland, Italy, Sweden and United Kingdom; 0.42 when the firm operates in Hong Kong, Indonesia, Sri Lanka, Thailand or Vietnam; and 0.08 when the operator identified is in Australia.

possible ownership advantages such as managerial skills or technological capability that affects firms' internationalization. In particular, we define a dummy variable for each multinational group.

We also consider the attractiveness of the host market by including the variables *Herfindahl Index* and *GDP pc growth*. While *Herfindahl Index* refers to the degree of industry concentration, *GDP pc growth* shows the annual percentage growth rate of GDP per capita in each country. Our model additionally assesses possible time influences by incorporating *year dummies*.

Regarding the second part of the empirical analysis, we have included the dummy variables *3G availability* and *4G availability* that control for the first period in which each technological generation was launched in the country. Similarly, the two dummy variables, *group 3G* and *group 4G*, identify the period from which the MNE offers the 3G and 4G, respectively, in any market. Finally, we control for the subsidiary competitive position through the variable *market share* that refers to total users the firm has at the end of the period, expressed as a percentage share of the total market users in a country.

4.4.1.3. Descriptive statistics

Table 4.2 present the descriptive statistics and correlations between the variables included in the study. The cultural distance between the home and host countries in our sample ranges from 0 to 5.34, which shows considerable variability to test hypothesis 1. As expected, the correlation matrix shows that *cultural distance* is positively related to lower levels of ownership control. Moreover, the *adoption speed of innovations* is negatively related to the variable *shared ownership*, while the *developed host country* dummy presents a positive correlation with the *adoption speed of innovations*.

4.4.2. Methodology

The aim of our study is twofold. Firstly, it attempts to disentangle conflicting evidence about those factors that influence MNEs entry mode decisions. Specifically, we consider that MNEs entry mode decisions in culturally distant markets may vary depending on the MNE home country. To test this initial conjecture, we define a binary variable that identify multinationals entry mode according to the control exerted by MNEs over its subsidiaries (shared ownership vs. full ownership). Secondly, our contention is that, once entered a given market, the entry mode choice will influence firms' innovation behavior. Nevertheless, as mentioned above, the decision of how to enter would be influenced by several factors such as the cultural distance between the MNE home and the subsidiary host country. Therefore, the analysis of how the entry mode choice shapes subsidiaries innovation should take into account that such choice is endogenous.

The failure to consider endogeneity in entry mode studies may have lead researchers to incorrect or misleading conclusions (see Brouthers and Hennart, 2007). In order to correct for such endogeneity related to the entry mode choice, we estimate a Heckman two-stage model (Heckman, 1979). In the first stage, a probit regression is used estimate the probability of choosing a shared-owned entry mode when expanding to a foreign market (Hypothesis 1). This regression is used to estimate the inverse Mills ratio for each firm, which is used as an instrument in the second regression that accounts for potential sample selection bias. Then, we estimate in a second stage a random-effects GLS regression to test whether the entry mode affect subsidiaries' adoption speed of innovation (Hypotheses 2 and 3). The correction for self-selection variable (the Mills ratio) is included in the second stage to control for unobservable characteristics that may affect the entry mode choice.

Table 4.2. Descriptive analysis and correlations

	Variable	Obs.	Mean	St. Dv.	Min	Max	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]	[14]
[1]	Shared ownership	9223	0.51	0.50	0	1	1.00													
[2]	Adoption speed of innovations	9223	32.06	14.03	0	55	-0.33	1.00												
[3]	Cultural distance	9223	1.48	1.33	0	5.34	0.11	-0.12	1.00											
[4]	Developed home country	9223	0.78	0.42	0	1	0.02	0.18	0.27	1.00										
[5]	Developed host country	9223	0.38	0.48	0	1	-0.23	0.51	-0.01	0.33	1.00									
[6]	Group size	9223	14.62	6.53	1	27	-0.10	0.09	0.25	0.34	0.09	1.00								
[7]	Regional intensity	9223	0.60	0.27	0.037	1	-0.23	0.13	-0.23	-0.30	-0.05	-0.42	1.00							
[8]	Herfindahl Index	9223	3.55	1.13	1.15	10	-0.01	-0.03	0.05	-0.14	-0.19	0.08	-0.08	1.00						
[9]	GDP pc growth	9223	2.21	3.52	-22.23	24.67	0.11	-0.15	0.03	-0.01	-0.24	-0.03	0.03	-0.00	1.00					
[10]	3G availability	9223	0.84	0.37	0	1	-0.10	0.13	-0.04	-0.01	0.20	0.09	-0.02	-0.23	-0.22	1.00				
[11]	4G availability	9223	0.29	0.46	0	1	-0.05	-0.14	-0.06	-0.05	0.12	0.02	-0.04	-0.13	-0.08	0.28	1.00			
[12]	Group 3G	9223	0.91	0.29	0	1	-0.01	-0.05	0.06	0.11	0.03	0.17	-0.09	-0.13	-0.06	0.50	0.17	1.00		
[13]	Group 4G	9223	0.43	0.50	0	1	0.04	-0.30	0.02	-0.03	-0.03	0.14	-0.13	-0.12	-0.08	0.38	0.68	0.27	1.00	
[14]	Market share	9223	0.31	0.17	0	1	-0.10	0.15	-0.08	-0.07	-0.09	0.09	0.02	0.53	-0.03	-0.09	-0.01	-0.10	-0.00	1.00

4.5. RESULTS

Table 4.3 reports the results of the Heckman model carried out in our empirical analysis. As can be seen, the first three columns refer to the first stage of the Heckman estimation, whereas the last trio encompasses the second stage in which the inverse Mills ratio is included.

In order to test Hypothesis 1, we should take a look at the first three columns, which considers *shared ownership* as the dependent variable. Model 1 shows the results of the baseline model, which only contains the control variables. Model 2 includes the effect of *cultural distance* and *developed home country* as independent variables, while Model 3 incorporates its interaction effect to test Hypothesis 1. As shown at the bottom of Table 4.3, all models are globally significant and the values of F-tests confirm that the full model is preferred to its simple counterparts.

Firstly, it is important to note that the variable *cultural distance* shows a positive and significant coefficient in Model 2 ($\beta=0.581$; $p<0.01$) and Model 3 ($\beta=1.811$; $p<0.01$). Thus, in line with prior literature, a greater cultural distance seems to be positively associated with *shared ownership* entry modes. In other words, the more culturally distant markets are, the lower the probability of entering with higher equity entry modes. Regarding the effect that the MNEs origin exerts on their entry decisions, the negative coefficient of the *developed home country* seems to be in line with our expectations, though its effect is not significant ($\beta=-3.346$; $p>0.10$). However, as can be seen in Model 3, the interaction term between the *cultural distance* and the *developed home country* shows a negative and statistically significant coefficient ($\beta=-1.318$; $p<0.10$). The development of MNEs home country seems to reduce the positive effect of cultural distance previously found, supporting Hypothesis 1. Therefore, the probability of choosing shared ownership in more distant markets is confirmed

to be lower for MNEs from developed economies than for MNEs from developing economies.

Table 4.3. Heckman's two-stage model

	First stage			Second stage		
	(1) Shared ownership	(2) Shared ownership	(3) Shared ownership	(4) Adoption speed of innovations	(5) Adoption speed of innovations	(6) Adoption speed of innovations
Cultural distance		0.581*** (3.63)	1.811*** (2.79)			
Developed home country		-3.346 (-1.27)	-1.714 (-0.96)	14.13*** (4.63)	14.21*** (4.65)	14.22*** (4.66)
Cultural distance*Developed home country			-1.318* (-1.86)			
Shared ownership					-0.766** (-2.48)	-0.953** (-2.33)
Shared ownership* Developed host country						0.275 (0.84)
Developed host country	-2.871*** (-7.14)	-2.099*** (-6.04)	-2.265*** (-4.13)	15.33*** (10.20)	15.07*** (10.06)	14.88*** (9.79)
Group size	-0.0373* (-1.77)	-0.0384* (-1.86)	-0.0410* (-1.82)	0.108*** (5.62)	0.112*** (5.78)	0.112*** (5.79)
Regional Intensity	3.992*** (9.17)	3.998*** (10.25)	4.146*** (8.09)	-0.138 (-0.28)	0.163 (0.32)	0.214 (0.41)
Herfindahl Index	0.581*** (8.53)	0.570*** (8.32)	0.589*** (7.64)	0.00125 (0.02)	0.0356 (0.50)	0.0385 (0.54)
GDP pc growth	0.0488*** (3.94)	0.0490*** (3.92)	0.0499*** (3.94)	-0.0901*** (-7.62)	-0.0880*** (-7.48)	-0.0878*** (-7.47)
International group dummies	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
3G availability				1.258*** (10.06)	1.266*** (10.12)	1.265*** (10.11)
4G availability				-4.140*** (-21.72)	-4.155*** (-21.73)	-4.155*** (-21.72)
Group 3G				0.0134 (0.09)	0.0273 (0.19)	0.0239 (0.16)
Group 4G				-0.839*** (-3.63)	-0.839*** (-3.63)	-0.840*** (-3.64)
Market share				1.946*** (2.67)	2.132*** (2.91)	2.118*** (2.90)
Mills ratio				0.0211 (0.50)	-0.160* (-1.90)	-0.184** (-2.04)
Constant	-3.072*** (-2.99)	-4.287* (-1.91)	-5.316*** (-3.99)	15.06*** (7.48)	15.20*** (7.54)	15.33*** (7.59)
N	10809	10809	10809	9223	9223	9223
Chi2	1058.1***	1353.7***	1020.7***	17073.6***	17231.6***	17272.3***
F-test vs. model 1	.	13.88***	11.78***	.	.	.
F-test vs. model 2	.	.	3.46*	.	.	.
F-test vs. model 4	.	.	.	.	6.16**	6.36**
F-test vs. model 5	.	.	.	.	.	0.71

***, **, * Coefficient statistically significant at 1%, 5% and 10% levels, respectively.

To evaluate how the entry mode decision influences subsidiaries innovation, we consider the last three columns in Table 4.3. As in the first stage, Model 4 shows the effect of the control variables on the dependent variable *adoption speed of innovations*. Model 5 incorporates the effect of *shared ownership* as an independent variable. Finally, Model 6 includes the interaction term between *shared ownership* and *developed host country* to test the moderating effect of the host country on the relationship between ownership concentration and adoption speed of innovations. The correction for self-selection variable is included in all models of the second stage. The statistical significance of the inverse Mills ratio indicates the presence of a sample selection bias in our model. As shown at the bottom of Table 4.3, the explanatory power of all models is adequate according to their chi-squared values and the F-tests confirm that Model 5 is the preferred one.

Regarding Hypothesis 2, results in Table 4.3 show that the coefficient of the variable *shared ownership* in Model 5 ($\beta=-0.766$; $p<0.05$) and Model 6 ($\beta=-0.953$; $p<0.05$) is negative and significant. This means that, as predicted, those subsidiaries with a more dispersed ownership present lower adoption speed of innovations, all other factors being constant. These results support Hypothesis 2.

Finally, contrary to our expectations, the degree of development of the host country does not moderate the relationship between the ownership concentration and the adoption speed of innovations. It can be observed that the interaction term between the variables *shared ownership* and *developed host country* is positive but not significant ($\beta=0.275$; $p>0.10$). Despite the positive impact is in line with our expectations, Hypothesis 3 cannot be accepted.

4.6. CONCLUSION AND DISCUSSION

The purpose of this research has been to shed light on those factors that trigger MNEs behavior when entering foreign countries and implementing their innovation strategies. In particular, it has focused on (1) the effects of development of the country of origin of the MNEs, as a moderator in the relationship between cultural distance and the mode of entry, (2) the consequences of the mode of entry on the speed of adoption of innovations by the MNEs and (3) the moderating behavior of the development of the host country in the relationship between the mode of entry and the adoption of innovations. Mainly using the IB literature and TCT, we have proposed that (1) MNEs originated in more developed countries would show a preference for fully owned subsidiaries, reducing the negative effects of cultural distance on this mode of entry; (2) shared owned subsidiaries would be slower than fully-owned subsidiaries in adopting innovations and (3) that shared-owned subsidiaries will be more prone to quickly adopt innovations in more developed countries, reducing the negative effects of shared ownership on their adoption behavior. If we distinguish between the decision on the mode of entry of the MNE and the innovating behavior of the subsidiary we can draw the following two groups of conclusions.

First, our study confirms the negative influence of cultural distance between home and host countries in MNEs entry mode decisions when internationalizing. In line with prior literature, the greater the cultural distance, the more likely the decision of entering with a shared-owned subsidiary. Furthermore, the empirical evidence reveals the key role played by the country of origin when explaining differences in MNEs international expansion. In that regard, our results confirm that MNEs from developed economies are more likely to penetrate new markets via fully owned-subsiidiaries, diminishing the negative effect of cultural distance on foreign affiliates ownership concentration.

Second, the entry mode choice is confirmed to significantly influence firm innovation. Our findings show that the speed of adoption of innovations is negatively related to the degree of subsidiaries ownership concentration. As predicted, our findings show greater levels of adoption speed for fully owned rather than shared-owned ventures. However, we do not find evidence of the moderating role played by the development of the host country on the entry mode-innovation relationship.

Overall, these findings contribute to the improvement of both international business and innovation research in the following ways. From an international business perspective, our study reveals the potential of context-country moderator effects in explaining prior conflicting evidence in entry mode studies (Beugelsdijk et al., 2018; Tihanyi et al., 2005). The examination of home country moderators yielded significant differences in MNEs decisions regarding entry mode decisions in culturally distant markets. Moreover, this research addresses scholars' demands on studies that focus on MNEs post-entry behaviors (Canabal and White, 2008). By focusing on the innovation behavior of the subsidiary, our research provides new insights regarding differences in their behavior that are conditioned by ownership structure. In particular, we expand prior knowledge on product innovation of international joint ventures in emerging economies (Zhang et al, 2007; Zhou and Li, 2008) by considering the speed of adoption of innovations. Not only that, our setting, which includes a much wider set of subsidiaries, operating worldwide, and different modes of entry, is much more comprehensive than the ones found in previous research. Finally, our methodology controls for the potential endogeneity of the entry mode decision in the analysis of the innovating behavior of subsidiaries. This is important, as our results show, and underscore the importance of controlling for endogeneity in those studies analyzing entry mode as main determinant of firms' strategies or performance, as suggested by Shaver (1998).

Regarding the implications for the innovation literature, we contribute to the understanding of how ownership concentration enhances firm innovation (Belloc, 2011; Choi et al., 2011, 2012). By drawing attention to the role of MNEs ownership structures (Zhang et al., 2007; Zhou and Li, 2008), our study reveals that more concentrated ownership ventures are able to adopt innovations more quickly than those presenting shared ownership. This evidence complements previous studies and underlines the importance of considering the ownership structure of subsidiaries as a key driver of innovation and, consequently, of competitiveness and value creation abroad.

Finally, several issues are presented as they might improve further analysis. On the one hand, it would be convenient to delve into the understanding of those context factors that influence MNEs behavior. Specifically, further studies could elaborate a fine-grained classification of countries, going beyond our dichotomous categorization of developed-developing economies. Moreover, it would be interesting to evaluate the extent to which different national dimensions, such as university education density, government efficiency or supportive innovation infrastructure (Furman et al., 2002), influence firms' innovation decisions. On the other hand, our study considers MNEs entry modes as a main determinant of subsidiaries innovation. Future research would benefit from extending our analysis by examining not just the antecedents, but also the consequences of subsidiaries innovation. For instance, the analysis of the extent to which subsidiaries innovation affects their performance (e.g., sales growth, profitability) could enrich current evidence.

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Chapter 5.

SUMMARY AND CONCLUSIONS

5.1. SUMMARY AND CONCLUSIONS

This dissertation comprises five chapters. The introduction developed in Chapter 1 aims at showing the main objectives of this thesis. Chapters 2, 3 and 4 aim to offer theoretical arguments as well as empirical evidence to expand current knowledge on firms' entry timing and entry mode decisions. Finally, Chapter 5 provides an overview of this dissertation by presenting a brief summary. Particularly, it highlights the objectives proposed and the main conclusions and contributions that can be drawn from each of them.

Chapter 1 presents the introduction of the dissertation, which is divided in four sections. The first section aims at motivating the research questions that are addressed in the studies presented in the following chapters. We show that strategic decisions on market entry are crucial in determining organizations' competitiveness and success. Given its importance, a wide body of research has shown interest in analyzing the effect of entry-timing decisions on firm performance (Zachary et al., 2015) and the determinants of multinationals entry mode decisions when going abroad (e.g., Mutinelly and Piscitello, 1998). Despite extensive research, both conceptual development and further empirical evidence are needed in both lines of research. This dissertation aims to provide new insights on conflicting evidence shown in previous research by addressing different gaps in the following chapters.

The second section presents the structure of the dissertation. Then, the theoretical frameworks used in Chapters 2, 3 and 4 are presented. Finally, the fourth section describes the evolution of the mobile industry, highlighting its increasing worldwide social and economic importance worldwide, as well as its suitability to analyze firms' market entry decisions.

Chapter 2, “*Does order of entry determine competitive strategies? An analysis of European mobile operators*”, has analyzed the effect of the order of entry on the competitive strategies implemented by firms. Traditional studies on the entry-timing literature have analyzed the impact of the order of entry on the achievement of competitive advantages (Fosfuri et al., 2013; Lieberman and Montgomery, 1988; 2013; Zachary et al., 2015). Despite a considerable body of research focused on analyzing the benefits of entering first, there is still a lack of consensus on empirical evidence (Suarez and Lanzolla, 2007). To clarify mixed results on this issue, Chapter 2 highlights the importance of entry-timing decisions in determining firms’ competitive strategies. In particular, the theoretical model proposes that first-movers will be more likely to follow a differentiation strategy in the initial stages of the market because of two main reasons. First, differentiation strategies will offer a better fit with consumers’ characteristics and demands in the early stages of the industry life cycle. Second, differentiation strategies will be also consistent with the isolating mechanisms that give rise to first-mover advantages. Besides, Chapter 2 considers the way in which the industry life cycle affects the evolution of firms’ strategy. As a way to readapt their strategy to new market demands, this chapter proposes that, over time, pioneers will be more likely to modify their strategy towards a hybrid one.

The empirical analysis is based on the whole population of mobile telecommunication operators that compete in 33 European countries between 2000 and 2016. The empirical evidence shows that pioneers are able to offer greater quality in their services and charge superior prices than followers. Surprisingly, they present better cost structures, which suggests that first-movers enjoy a hybrid position in the initial stages of market development. Contrary to our expectations, the pioneer is shown to gradually worsen its position as a cost leader over time. Moreover, the results confirm

that second entrants evolve towards a more advantageous position as they are able to reduce the gap between them and pioneers in terms of quality, price and cost positions.

Overall, Chapter 2 has several contributions to the first-mover advantage literature. In line with the theoretical model, pioneers seem to be able to create value through an alignment of certain competitive strategies and the isolation mechanisms that are enabled by an early entry in the market. The pattern discovered between the order of entry and the competitive strategy chosen by each cohort of entrants reveals the relevance of considering the strategy followed by firms when studying entry-timing advantages. Moreover, the empirical evidence from Chapter 2 provides new insights on the sustainability of first-mover advantages over time by taking into account how strategies evolve. In particular, we find the advantageous positions shown initially by pioneers are eroded as time goes by. More importantly, the results reveal key insights regarding how followers reduce the competitive advantages of entering first. In particular, second entrants are able to improve their relative quality position more quickly than pioneers, while suffering less from price erosion. This evidence expands current knowledge on how first-mover advantages are eroded.

Chapter 3, *“How to defeat early entrants: The role of competitive strategy and industry dynamism on early mover advantages in the telecommunications industry”*, moves Chapter 2 forward by analyzing whether the competitive strategies play a role in the theory of first mover advantages. It studies whether the best competitive strategy for each cohort of entrants is the most profitable option for them. In particular, early movers are expected to obtain greater profitability by using differentiation-like strategies, whereas cost leadership will be the best option for followers. Chapter 3 also advances the entry-timing agenda by addressing the effect of environmental factors on the maintenance of first-mover advantages (Fosfuri et al., 2013; Suarez and Lanzolla,

2007). The pace of industry dynamism is suggested to influence the effectiveness of the strategies implemented by followers to erode early-movers advantages. In particular, the effectiveness of cost leadership is expected to be higher for followers in context of greater market growth, whereas cost strategies are expected to be less effective in industries showing a higher pace of technological change.

The empirical analysis in Chapter 3 considers a total of 67 mobile operators competing in 18 European countries from 2006 to 2017. The empirical evidence confirms the existence of early mover advantages, as those firms that enter the market in first place achieve greater performance levels than followers. Chapter 3 also reveals that the order of entry is more important than competitive strategies as a predictor of firms' profitability. The fact of using one or another strategy makes little difference on early mover's performance. Conversely, competitive strategies do matter for followers, being cost leadership the strategy more profitable for them. Finally, the moderating role of industry dynamism is confirmed in the expected direction. Whereas a cost leadership position is shown to be more effective in contexts of high market growth, differentiation strategies seem to be as useful as cost strategies when technology evolves rapidly.

Three main theoretical contributions can be drawn from evidence in Chapter 3. First, it advances knowledge on the order of entry-performance relationship by examining how competitive strategies influence the way early entrants create and maintain their advantages over time. In that regard, Chapter 3 addresses current demands by explicitly considering the competitive strategies used to exploit of first-mover advantages. Second, this chapter contributes to the emerging body of research interested in analyzing how followers compete to beat early entrants. The comparative study developed offers valuable insights into the competitive positions that followers should pursue to reduce the performance gap with early movers. Finally, the

incorporation of environmental factors complements current research on the effect of industry dynamics on the persistence of early mover advantages.

Chapter 4, “*Entry mode and innovation adoption of multinational firms: The effect of cultural distance and home/host country development*”, focuses on the international business perspective. It addresses recent claims related to the potential determinants of multinational enterprises (MNEs) strategic decisions when expanding abroad. In particular, Chapter 4 delves into the examination of two main ideas.

First, international business studies have broadly examined the effect that the cultural distance between home and host countries have on MNEs entry mode decision. Despite the broadly accepted idea that cultural distance has a negative impact on the degree of control demanded by foreign investor (Mutinelly and Piscitello, 1998), the empirical evidence remains contradictory. Taking into account the mixed evidence on this issue, Chapter 4 considers the moderating effect of a MNE’ country of origin. As a result of cross country differences in social, regulatory or economic factors (Cuervo-Cazurra, 2012), MNEs from developing and developed economies are expected to behave differently in their internationalization process. In particular, it is proposed that the positive effect of cultural distance on the probability of choosing a shared ownership entry mode (vs. a full ownership entry mode) will be lower for MNEs from developed countries.

Second, Chapter 4 addresses current gaps in the literature by analyzing what happens after the entry mode choice has been made (Canabal and White, 2008). In particular, this chapter expands current knowledge on how subsidiaries compete and create value in foreign markets (Meyer and Peng, 2016) by analyzing the effect of entry mode on its innovation behavior. Based on arguments from the transaction cost theory,

shared owned subsidiaries are expected to show a lower adoption speed of innovations than fully owned ventures. Finally, the moderating role of the host country development in reducing potential opportunism is considered.

The data set used to carry out the empirical analysis consists of a total of 18 multinational groups operating in 91 countries during the period 2000-2017. Overall, the empirical evidence mostly confirms the hypotheses proposed in Chapter 4. However, contrary to our expectations, the moderating role played by the development of the host country on the entry mode-innovation relationship does not find support.

Overall, the contributions that can be drawn from Chapter 4 are the following. First, this chapter refines prior theoretical arguments by considering the key role of country conditions in shaping how MNEs behave when entering foreign markets. It contributes to the emerging body of research that focuses on analyzing the patterns of MNEs internationalization by taking into account the development of the home country. Moreover, Chapter 4 advances research by integrating the entry mode and the innovation literatures. In that regard, it expands current knowledge on MNEs post-entry behavior, while contributing to the analysis of the determinants of innovation by considering the role of ownership concentration.

5.2. REFERENCES

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